The CHEMIST AND DRUGGIST

ANNUAL SPECIAL ISSUE

SEPTEMBER 9 1959

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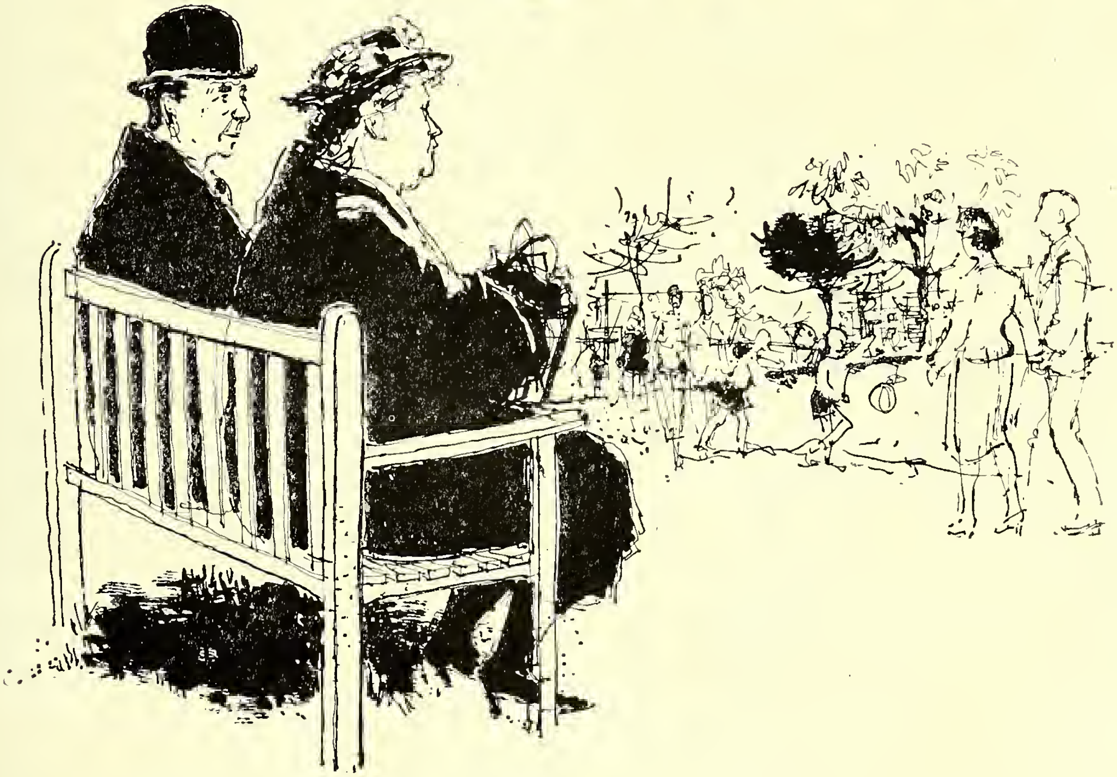

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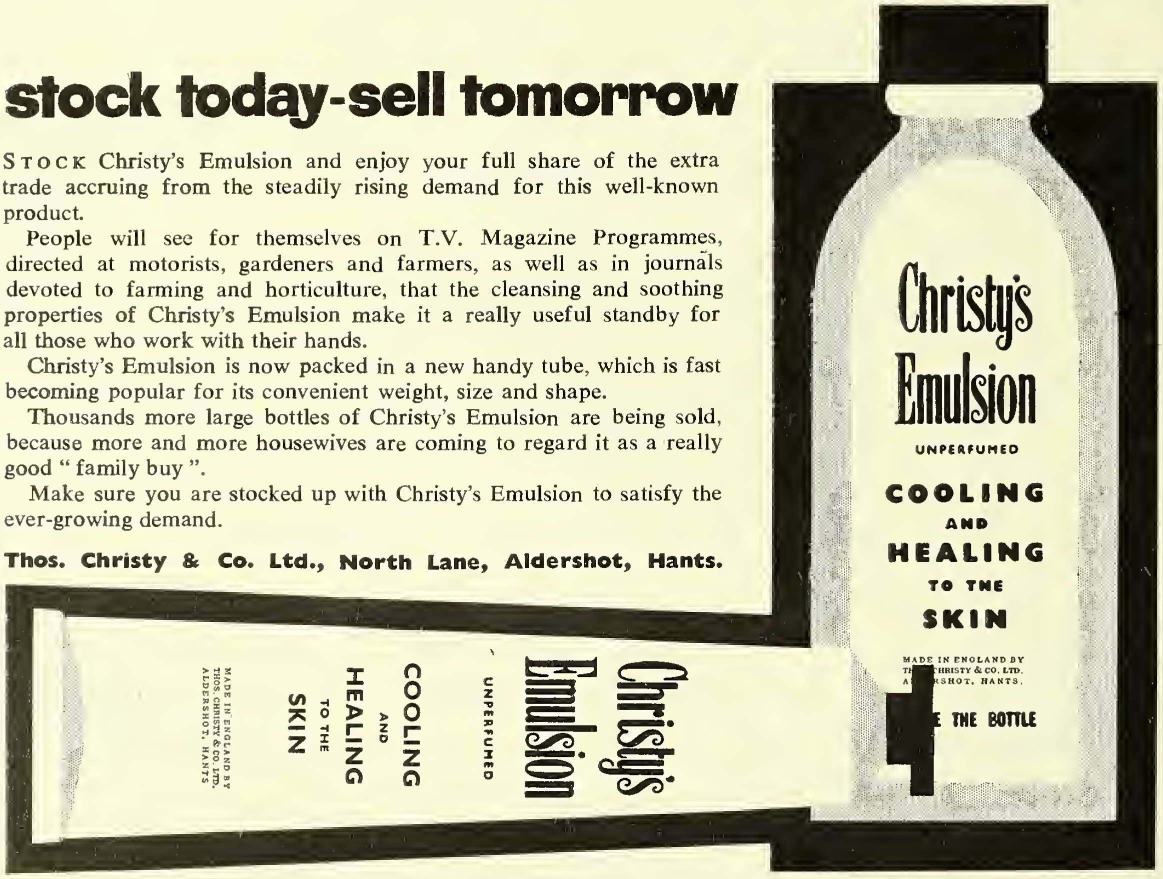

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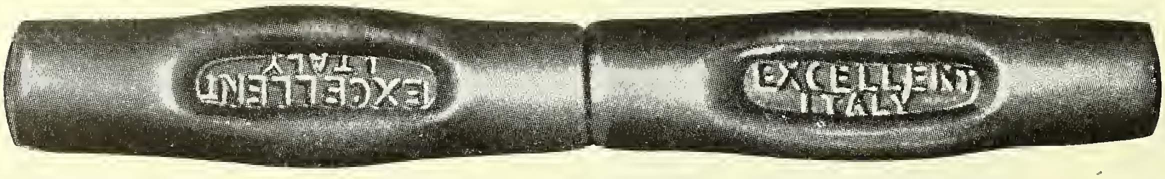

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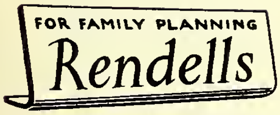

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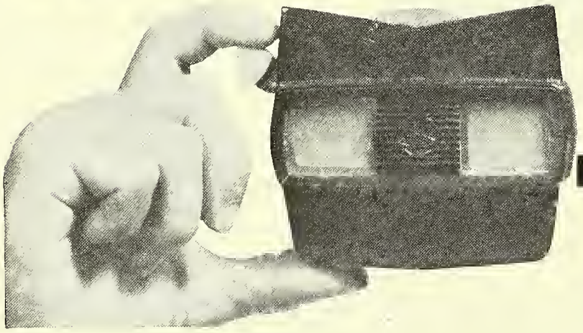

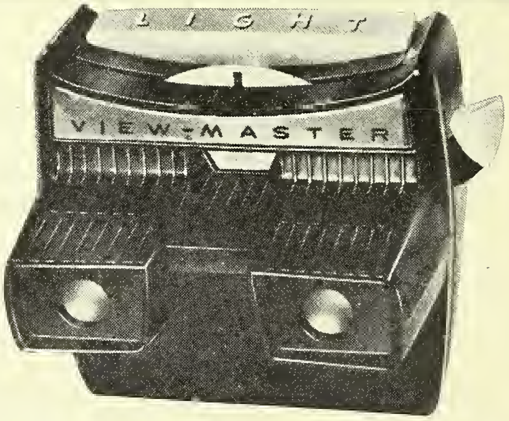

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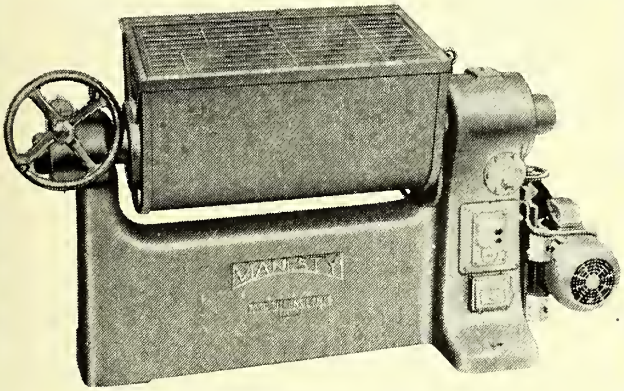

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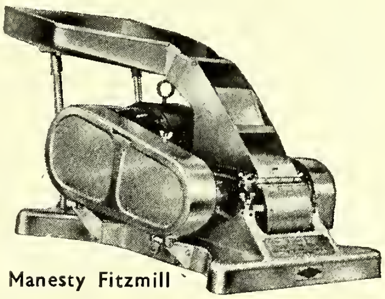

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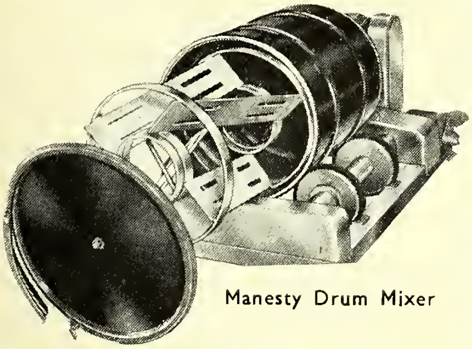

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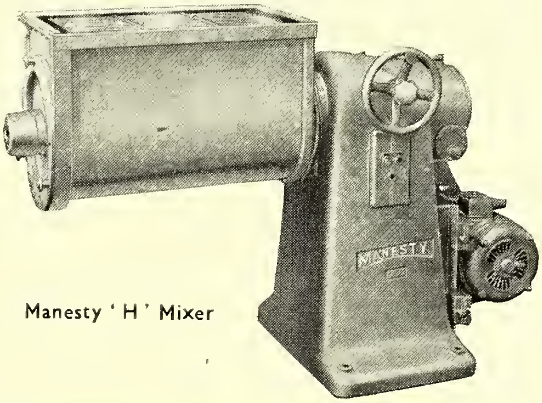

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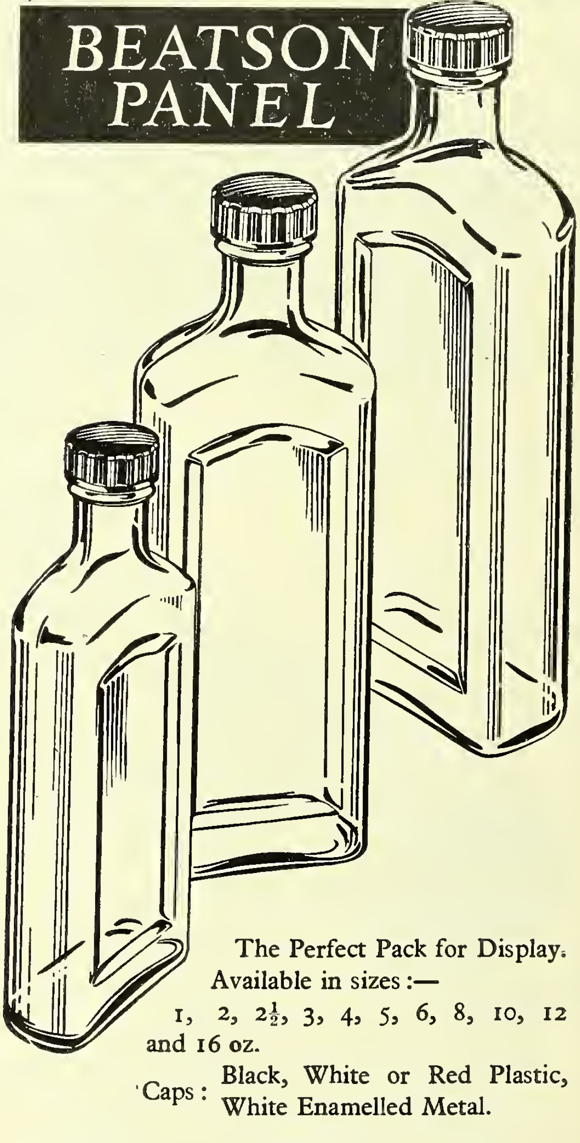

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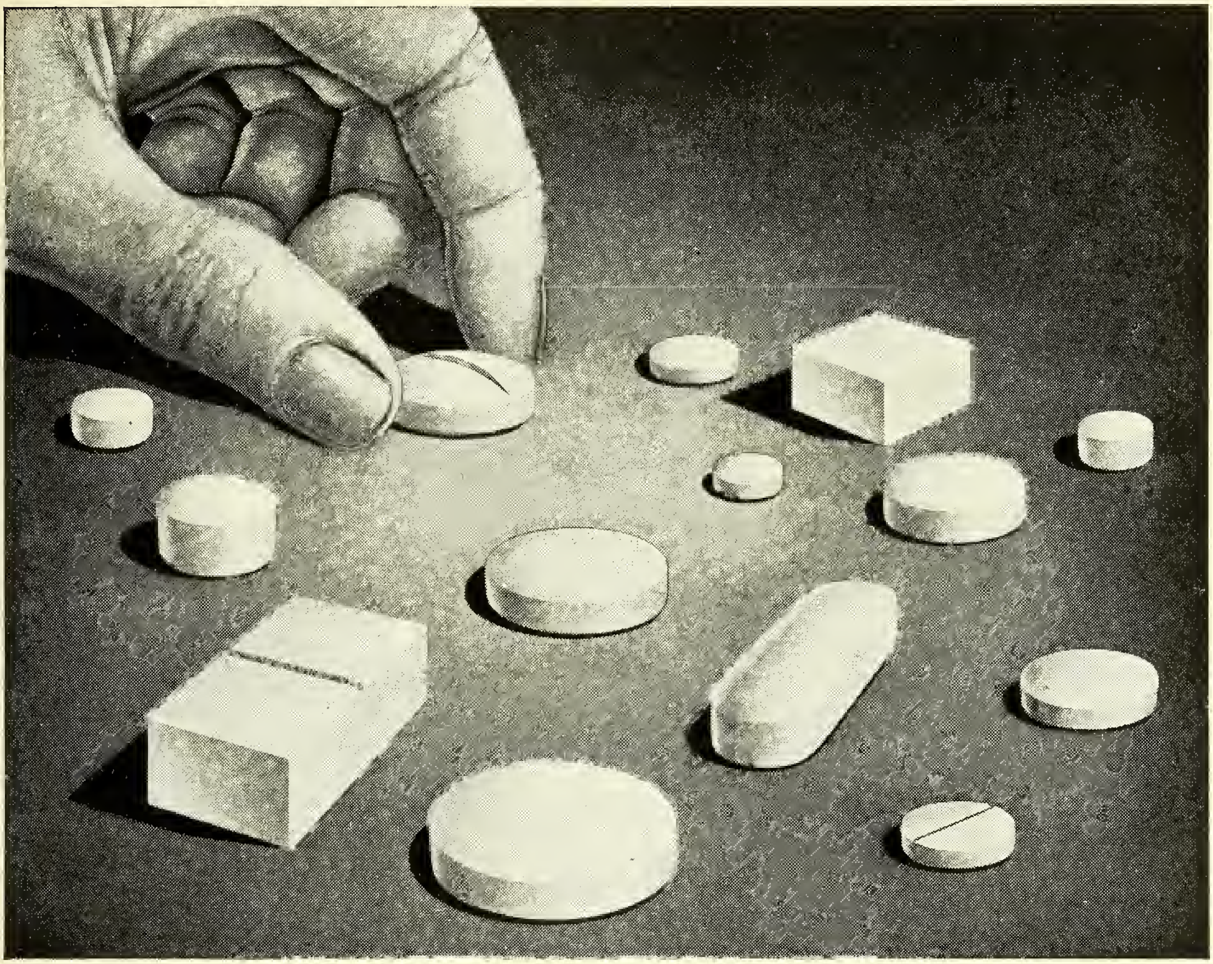

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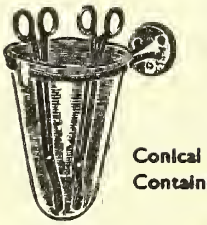

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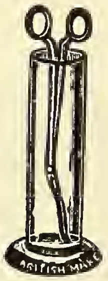

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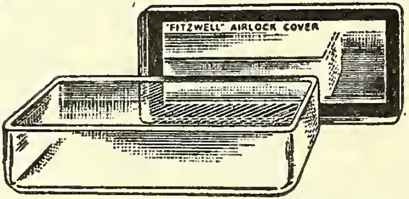

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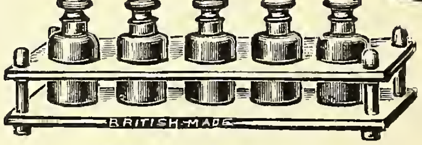

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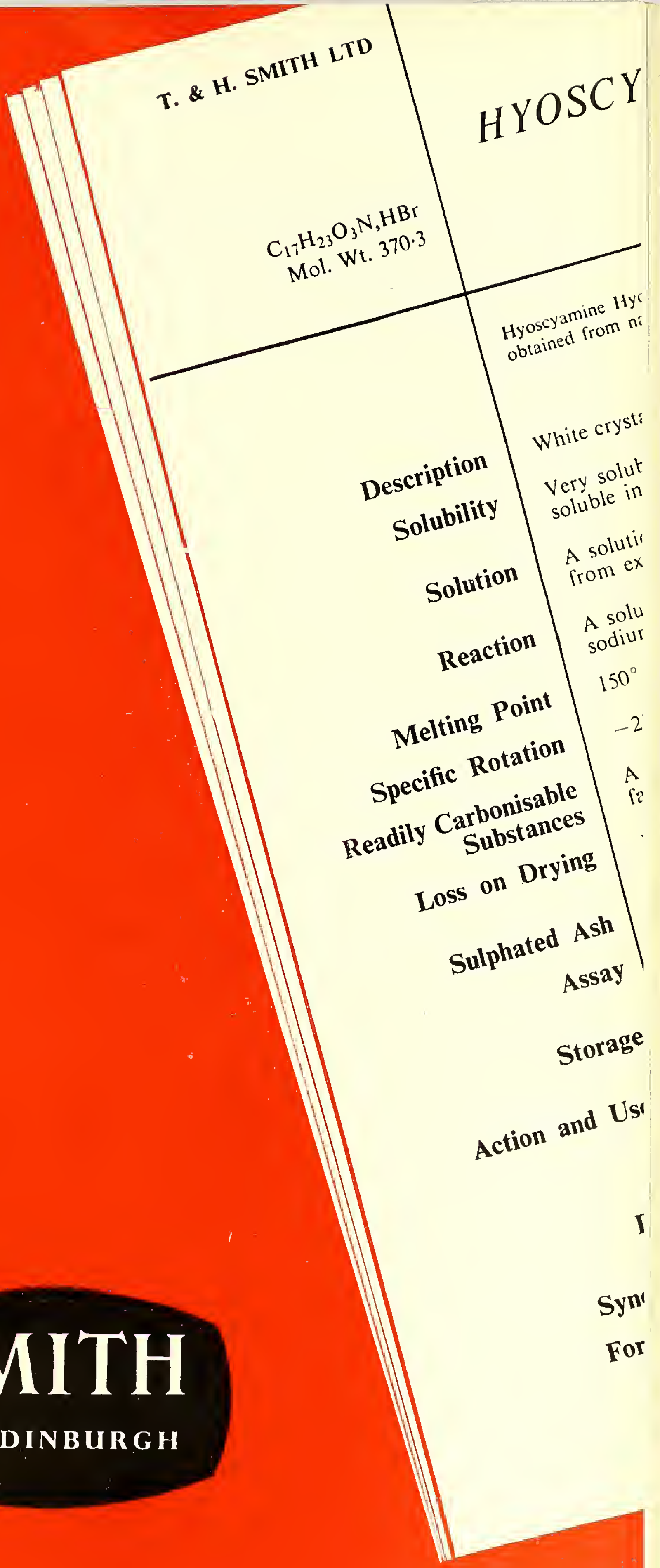

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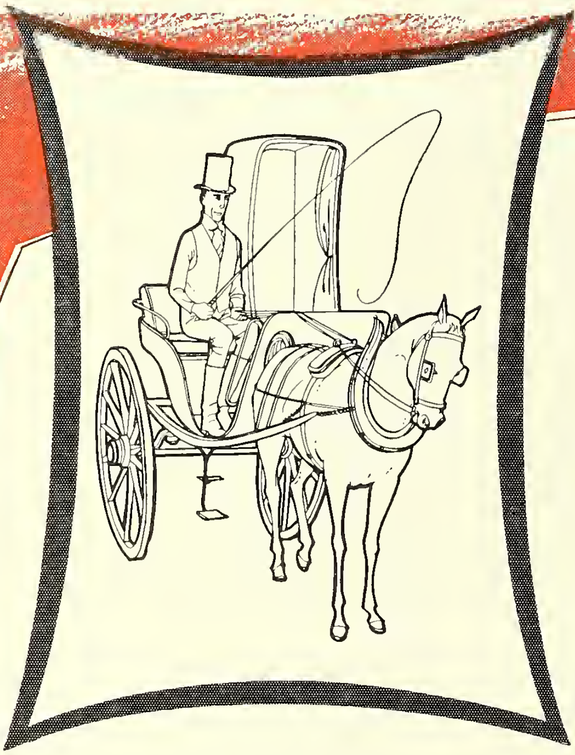

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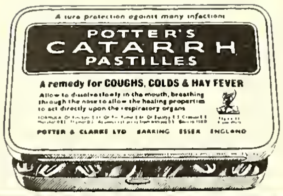
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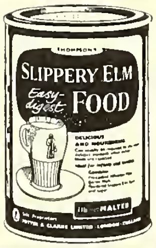

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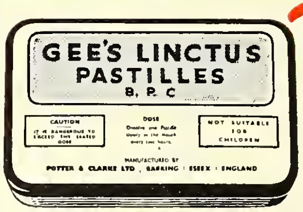
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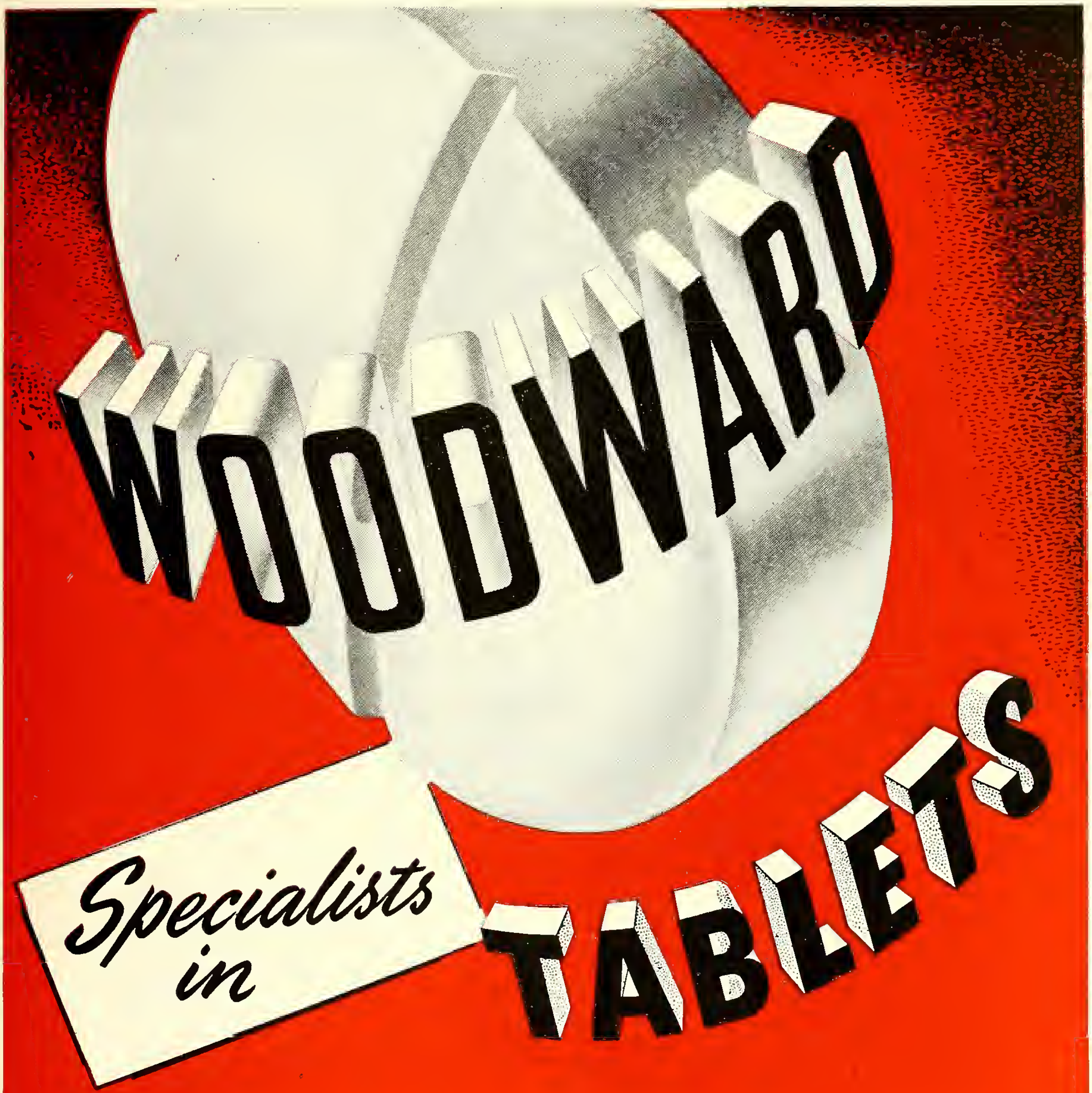

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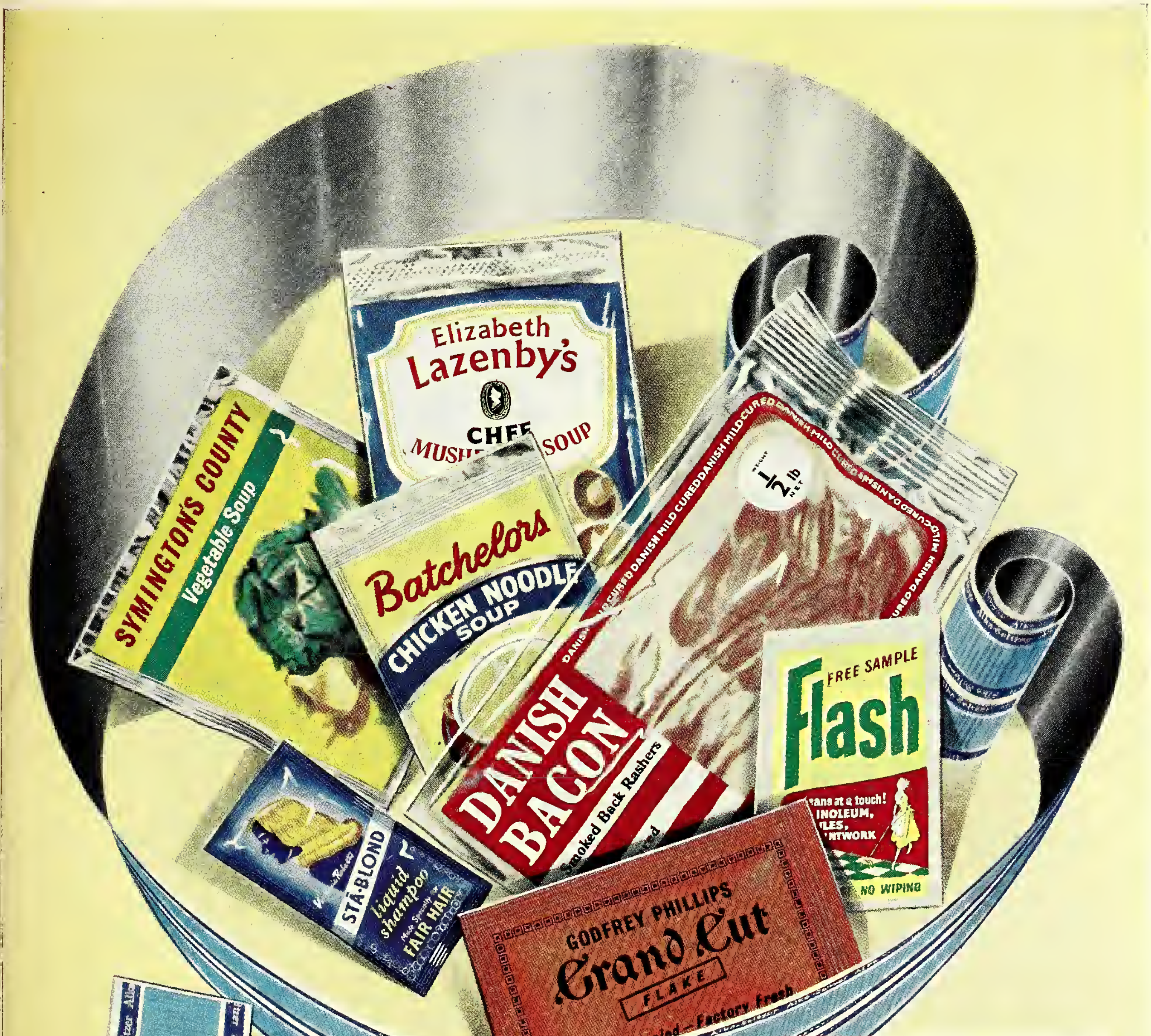
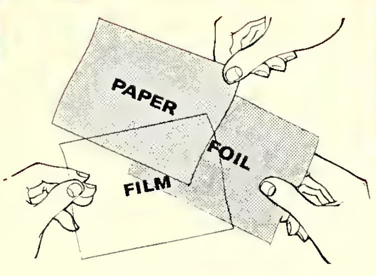


Metal Box tested laminations protect and sell these products

New packaging materials are increasing the scope of laminations: at the Metal Box research laboratories investigations are made to ascertain their suitability—the compatibility with the product, safe shelf life under a wide range of conditions, capabilities on high-speed forming and filling equipment—these points can be assured for your product by Metal Box before a final decision to use a lamination is made.

If you have in mind a free sampling campaign, market trials, nation-wide or even world-wide scheme for unit packs let Metal Box prepare a lamination which will *maintain the quality of your product.*



Light, compact and beautifully printed, laminations can combine the strength and rigidity of paper with the toughness and heat sealability of plastic film and foil. Many different material combinations are available in the form of reels or pockets which can be filled and sealed on high speed equipment.

Consult Metal Box Plastics Group—early

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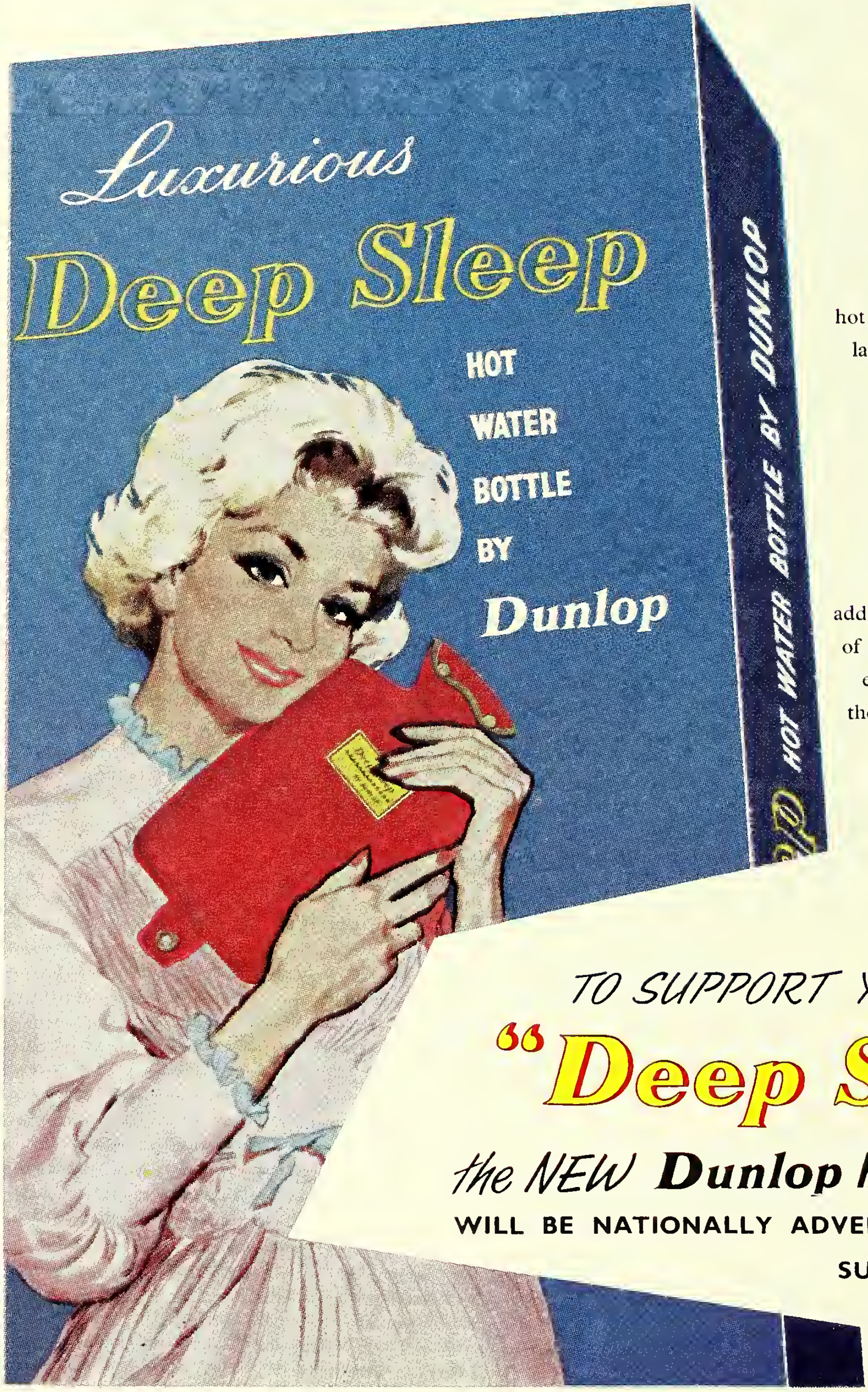

Dunlop's new Deep Sleep hot water bottle, made of seamless latex, takes boiling water, and so stays hot longer—and is luxuriously cosy in its velvety cover of primrose or cherry. The retail price is 25/-. The attractive pack helps your displays—makes it easy to sell. The Deep Sleep is a welcome addition to the 1959 Dunlop range of 13 bottles that includes one for every purse and purpose. Stock the popular Flag, retailing at 7/3, the new Fluted bottle at 7/- and the Cosimax, the warmest gift suggestion at 29/6.

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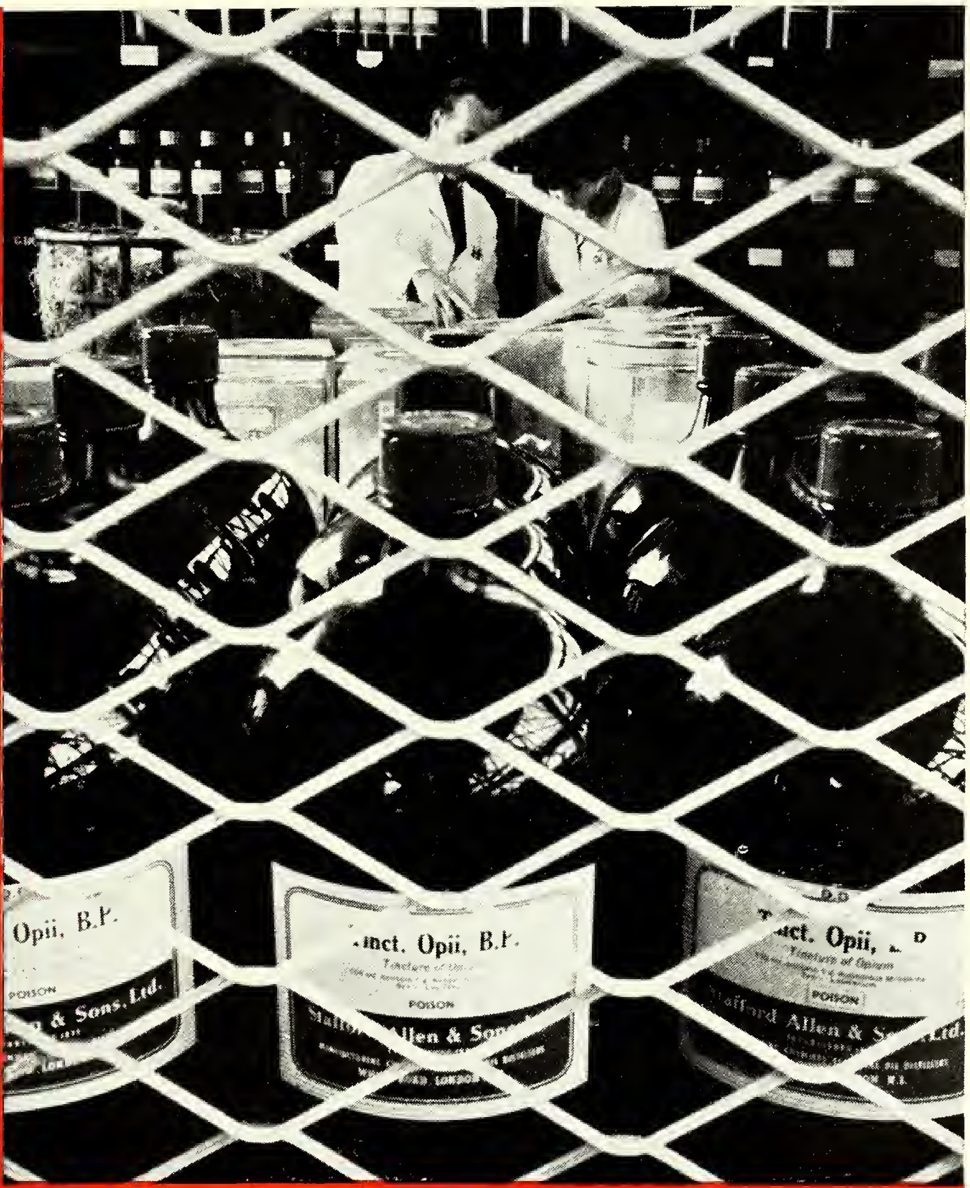

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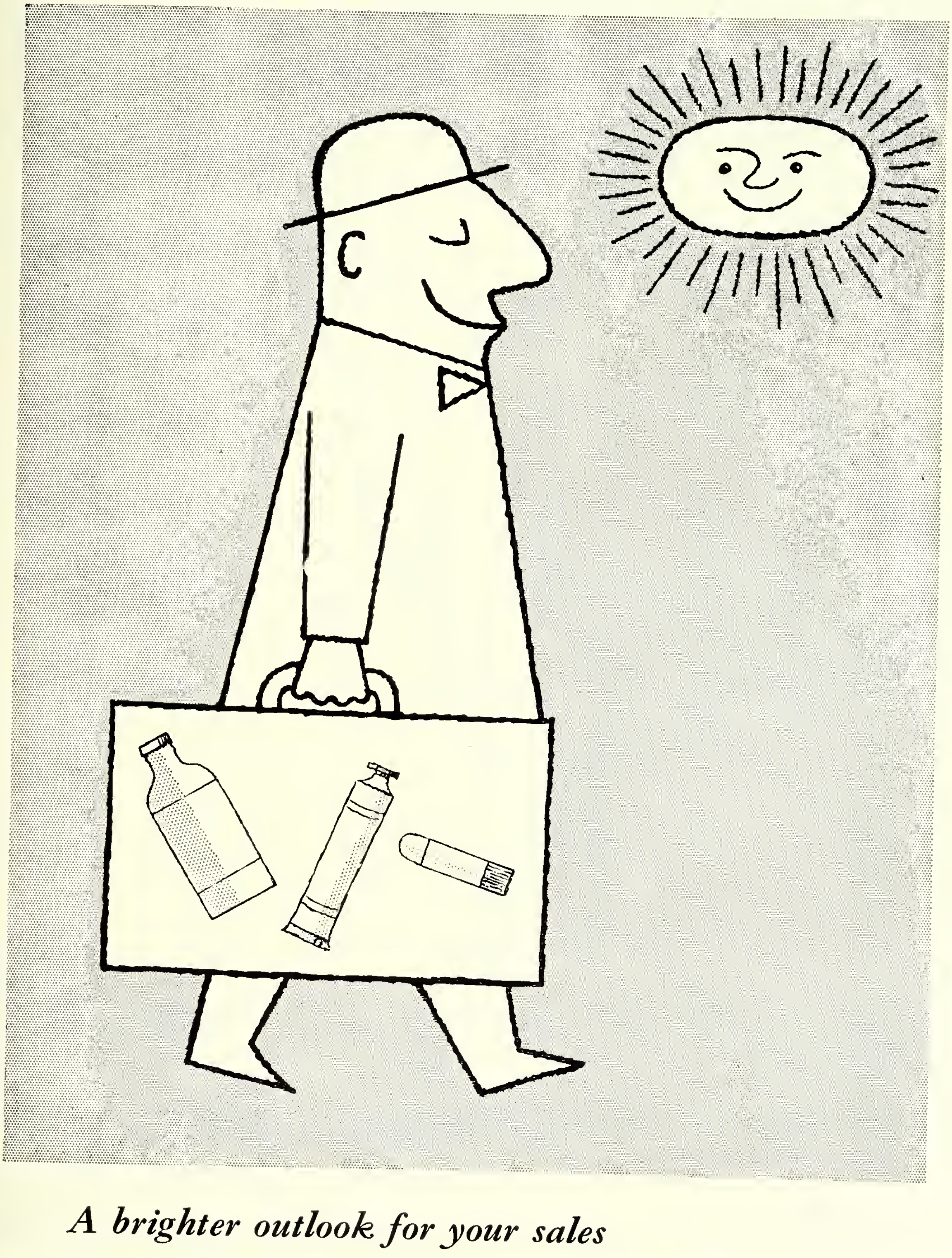

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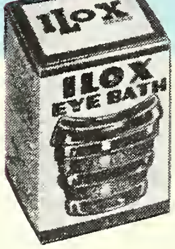

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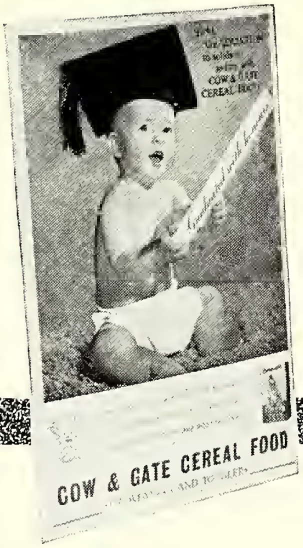

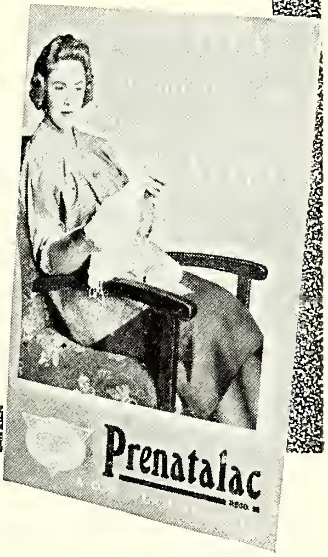

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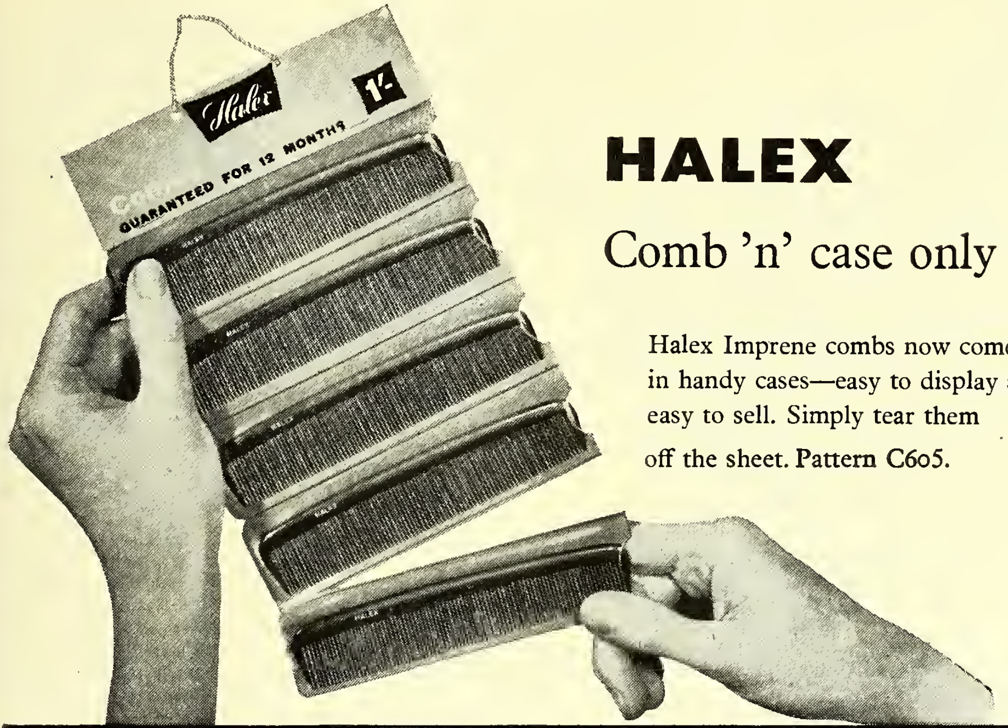

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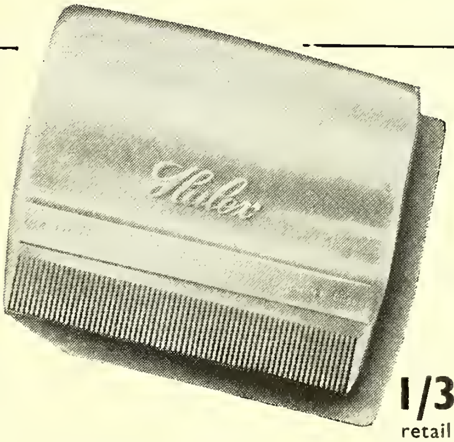

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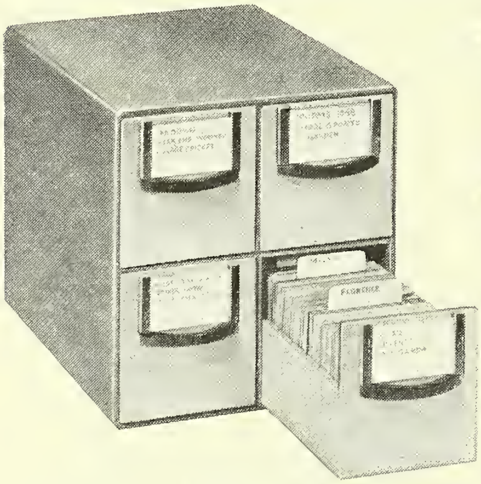

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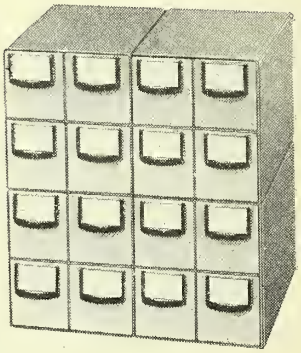

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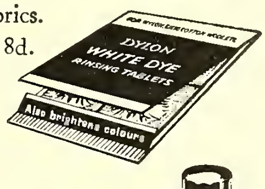
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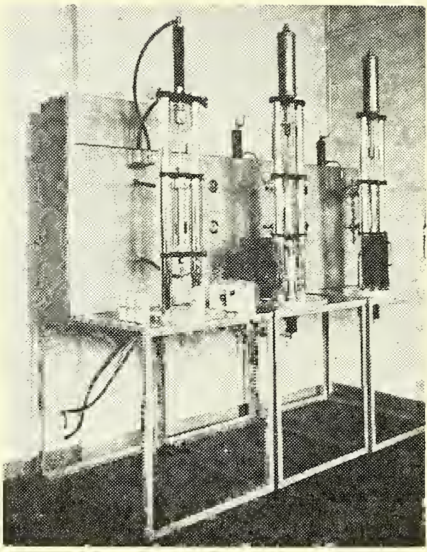

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The CHEMIST AND DRUGGIST
ANNUAL SPECIAL ISSUE

Volume 172 No. 4151

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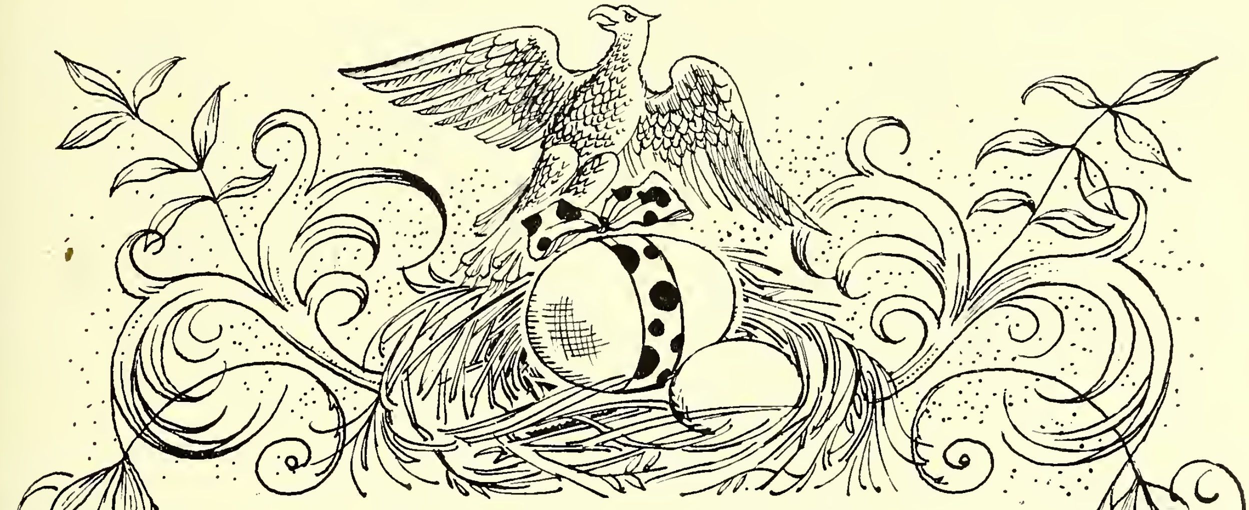


EXTRA SPECIAL

NORMALLY the *C. & D.* phoenix produces one egg—sorry, issue—a week with exemplary punctuality, if contrary to accepted mythology. Between June 27 and August 8, on a much reduced diet (no keyboard men, no compositors, no proof readers, no machine minders, no bindery workers) a much smaller egg—a passable imitation in shape and colour of the real thing but much reduced in content—appeared at approximately weekly intervals though somewhat late. The bird would have given up laying altogether without a substitute diet of (apprentice labour).

Since August 15 it has, in the best traditions of rising from ashes, been in full lay, with already two outsize eggs. This week she excels herself by laying twice—an unprecedented event. Saturday's egg, our expert ornithologists predict, will be normal in size and about average in content. The present mid-week specimen—extremely rich, all yolk—is of bumper size and has a certain gloss on the shell. It is a good egg, too, in another respect. You may eat it all and still have it—we are confident it will keep well—or you may separate out its contributory flavours and savour those which are most to your taste. Let us not delay you any longer from getting cracking.

BRITAIN'S LARGEST TOOTH-PASTE PRODUCER

Seven years of change at Whitehall Works, Leeds

MORE than 1,000,000 tubes of tooth-paste are produced every week at the factory of Joseph Watson & Sons, Ltd., Whitehall Works, Leeds. Until 1952 world-famous as makers of household soaps, the company, an associate within the Unilever group, was perhaps the one most radically affected by a decision of the parent board to centralise so far as possible the various manufacturing interests of the group. The decision involved a complete departure from the tradition of 100 years of soap-making, and the transformation of the works into a manufacturing unit dealing solely with toilet preparations and capable of producing for the Unilever group all such requirements within the United Kingdom, plus a sizeable export production.

The original soap-making business of Messrs. Watson grew from the modest start of a firm of hide and skin dealers, through the logical exploitation of by-products—fats and tallows—into soaps and candles. For three generations the Watson family controlled the destinies of the company, steadily expanding from the time in 1860 when the premises in Whitehall Road were acquired until 1920, when Lever Bros., Ltd., obtained control. Production of soaps and ancillary products continued until 1952, and naturally all buildings and production departments were designed purely for those functions.

Those who are familiar with the processes of soap-making will readily understand that, to transform the factory into a series of self-contained toilet-producing units, meant gutting all the buildings, taking out cumbersome soap pans, drying and cutting machines, and replacing them with the precision machines and instruments necessary for mass production of toilet preparations. For the past seven years, indeed, the production departments have been subject to constant change as new techniques, modern methods and machinery were developed, and even now the main tooth-paste packing room is being further remodelled.

The factory is divided into five main blocks: perfumery and shaving soaps production; offices, laboratories, canteens; tooth-paste making and packing; home permanent-wave creams, pomades, talcum powders and the central warehouse; engineers' stores and shops, liquid detergents and home permanent-waving lotions, ets. Beneath almost the whole length of the factory are store rooms for raw and packaging materials totalling 3.000 for a basic range of 350-400 manufactured products.

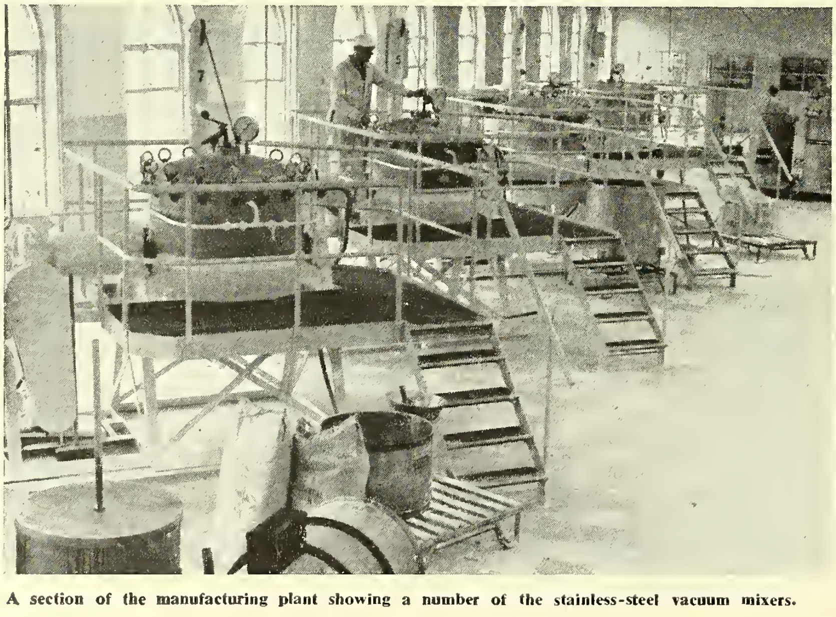
The output from the factory is such that, in a five-day week, deliveries of a total weight between 600 and 800 tons go out to distributing depôts. That prodigious output has presented problems of handling and loading, and recently three overhead systems of fork-lift loading were installed that have been found less expensive initially, and require less maintenance, than fork-lift trucks. Loading time has been considerably reduced. It used to take four labour hours to load seven tons of products. Now it takes at most twenty minutes!

The Manufacturing Plant

Although production covers a large range of products, emphasis is on tooth-pastes and dentifrices, both being in continuous production. The tooth-paste manufacturing plant consists of eight stainless-steel Thompson vacuum mixers which, with common air pressure and vacuum services, are laid out for independent operation and maintenance in a tiled room above the tube-filling and packing unit. According to the paste that is being made—S.R., Pepsodent (home and export types), Mentasol or Sky—the weight of mix varies from 1,500 to 1,900 lb. per batch.

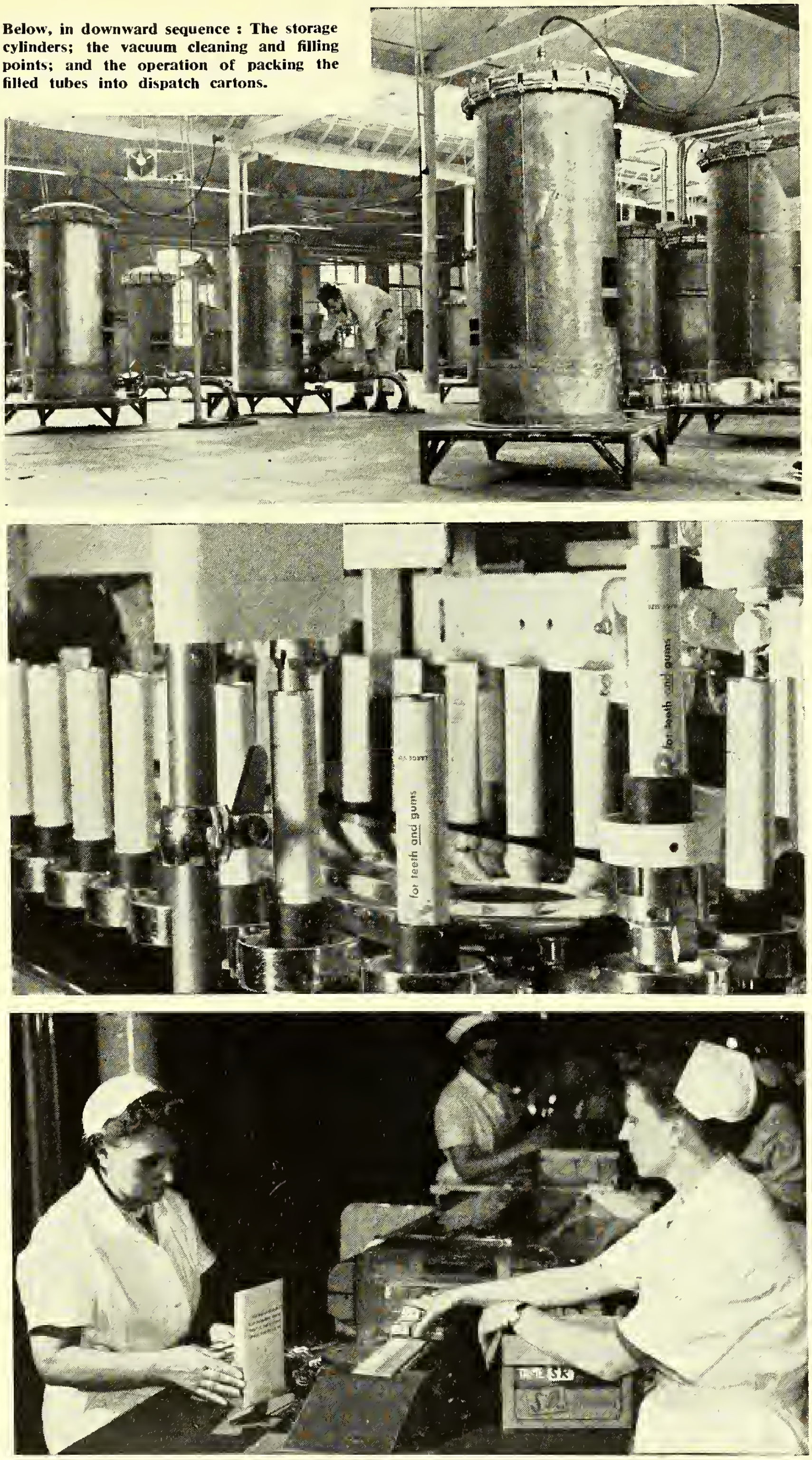
Partly because of the immense capacity of the tooth-paste production unit, it is now one of the most remarkable sections in the factory. Previously the group's tooth-pastes had been made at Unilever factories at Isleworth, Bermondsey, Wapping and Park Royal, London.

The ingredients for the paste—mainly chalk, glycerin, water, gum, foaming agent and flavouring, are weighed and/or measured and then drawn into the mixer by vacuum; each batch mix remains under vacuum. Mixing takes 5-10 hours to complete, again depending on the brand of preparation. Every step in preparation is recorded, and the information checked and filed. Flavour identification is by colour coding on the storage vessels, a range of seven flavours being used.



A section of the manufacturing plant showing a number of the stainless-steel vacuum mixers.

At the end of the mix specific gravity and viscosity are checked and the production manager ascertains that the correct flavour has been incorporated. When he has satisfied himself that all is well, he gives permission for the batch to be transferred, by air pressure, into mobile, half-batch-size stainless-steel cylindrical storage vessels. Ordinarily no mix is stored in the cylinders for more than twenty-four hours. When the material is needed the cylinders are connected to one of twelve points feeding, through stainless-steel pipes, hoppers on the floor below. Two storage vessels are used in tandem for each batch and, to ensure that the correct filling level is maintained, each hopper is equipped with a control system that gives visual and audible warnings to the operator in charge of the storage vessel. When the hoppers below are empty or full, valves on the manufacturing floor are switched as necessary from one cylinder to another.


Below, in downward sequence : The storage cylinders; the vacuum cleaning and filling points; and the operation of packing the filled tubes into dispatch cartons.

At the packing and filling department arrive boxes of empty open-ended aluminium tubes. The boxes are up-ended on a wire-mesh screen (still retaining the tubes) to remove any particles of dust. That is the first in a series of cleaning operations. The tubes are then all checked to ensure that no slivers of aluminium protrude and that no tube is damaged. Having passed those inspections the tubes go to one of six packing lines, each equipped with two Arenco tube-filling machines into which the paste is fed by gravity hopper. The machines operate at a rate of forty-eight tubes per minute each. The main packing lines accommodate two Arenco machines working in tandem with automatic cartoning machines, whilst others are equipped with pairs of filling machines feeding packing tables for hand operation. Immediately before passing under the filling nozzles the tubes receive a final vacuum clean. For filling they are placed cap downwards, and when filled pass through a folding and crimping mechanism, from which they are ejected on to a conveyor and hand-checked to ensure that the caps are correctly fitted. New machines, each capable of filling 120 tubes per minute, are already replacing the older ones, and every operation—cap tightening, vacuum cleaning, filling, closing, ejection to conveyor belts, cartoning—will become fully automatic.

After cartoning, the tubes may be packed into display, bulk or special combined packs. Throughout the whole process, indeed throughout the factory, the emphasis is on quality control (there is constant sampling at every stage of manufacture and packing) plus flexibility of production. The Arenco machines can be rapidly changed for handling any one of the four tube sizes, and standardisation of the tables and the easy mobility of the Arenco machines allow quick rearrangement of the unit if required. An interesting point is the small loss by wastage of tubes—amounting to only 0·8 per cent. from all causes.

The importance attached to hygiene is shown by the fact that those engaged on the production and packing of toothpastes and dentifrices are required to have a regular manicure in the works clinic.

Joseph Watson & Sons, Ltd., is solely a manufacturing company, the marketing of the preparations being undertaken by other companies in the Unilever group (D. & W. Gibbs, Ltd.; Pepsodent, Ltd.; Lever Brothers, Ltd.; Crosfields (CWG), Ltd.; Industrial Soaps, Ltd.; A. J. Seward & Co., Ltd.; J. & E. Atkinson, Ltd.; and A. & F. Pears, Ltd.).

Atomic War against an insect

British trials of a new insect control technique using gamma rays to sterilise male flies.

EXPERIMENTS BASED UPON WORK IN CURAÇAO

By

J. MacLeod

D.Sc., Ph.D.

(FIELD RESEARCH LABORATORY,
ANIMAL HEALTH DIVISION,
MINISTRY OF AGRICULTURE,
FISHERIES AND FOOD)

FOR a long time insects have competed unremittingly with man for world mastery. Some species attack his health, infecting him directly or indirectly with disease; others attack his comfort, ruining his tools and contrivances, his home and its contents. Those enemies form but a small minority of the species affecting man; the majority attack him indirectly, through his food supplies, his flocks and crops.

Only Tactical Engagements Possible

But the numbers of insect species are legion; well over half-million are known and they probably represent less than one-quarter of the total. Man dare not make a general attack on that host, for his very existence depends on an unknown proportion of insects continuing to play their part in the present economy of nature. He is therefore in the difficult position of having to confine himself to limited tactical engagements, and the best he can hope for is a series of small local victories punctuating an uneasy armed truce. Among the different methods of waging limited war the use of poisonous chemicals took early pride of place, and is still the most widely practised. Insecticides, however, have the weakness that they destroy beneficial as well as harmful species, and sometimes the price paid, in upsetting the balance of nature, has been more than the victory was worth.

A weapon was required that would act specifically against only the insect on which war was being waged at the moment, and so the method known as biological control was developed. In this method a parasite or predator is sought which confines its attention to the species being attacked. It is bred in large numbers and liberated in the conflict area to exterminate the pest and then, its work finished, to die through lack of food. Although successful results have occasionally been obtained, the method was found to have many limitations. Two general weaknesses have a bearing on the subject of this article:

(a) The scarcer the remaining pests become, the more the hunters have to search to find the last few individuals, and the hunters begin to die out before their task is finished. Insect populations being usually designed to withstand cataclysmic reductions in numbers, the decimated populations may recover in a few generations.

(b) Sometimes the hunters refuse to die out conveniently when their food supplies decrease, and instead turn to other food sources. Major catastrophes may occur in this way, or, less seriously, the introduced parasite or predator may attack allies also engaged in fighting the pest, so that the result may be a reduced rather than enhanced degree of control of the noxious species.

It is, then, in the light of the objection against insecticidal control of its "blunderbuss effect," killing friend and foe, and of the above two weaknesses in the more selective biological control method that one should view the recent publication by American workers of a new method of biological control, in which the species itself is used to encompass its destruction.

In 1955 a research team of the United States Department of Agriculture reported the elimination from the island of Curaçao of the screw-worm fly, the larvæ of which infest wounds on domestic animals. The method used was to liberate large numbers of sterilised males to compete with the native males of the species.

The flies were sterilised by exposure to gamma rays. That "peace-time use" of atomic energy has caught the public imagination, and the novelty of the essential principle in the method, which constitutes the real milestone in the progress of insect control, is perhaps overshadowed by the spectacular nature of the technique. The irradiation aspect is, however, relatively unimportant; with the progress of knowledge of insect biochemistry it may well be that simpler or cheaper methods of inducing sterility by chemical or other means will be discovered. The outstanding advance lies in the application of a simple mathematical proposition to the control of an animal species.

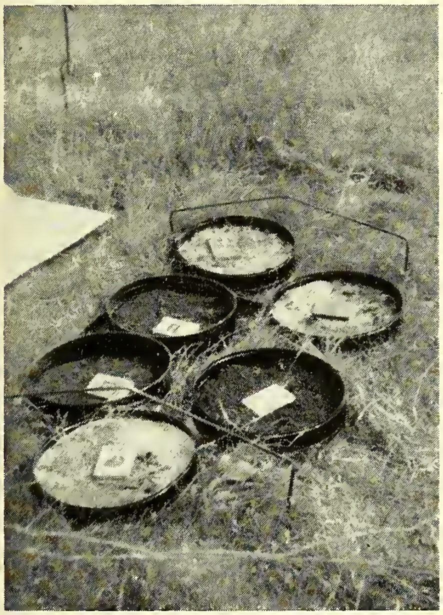
Mathematics of the Attack

In terms of screw-worms the argument is this. If to the native population of male flies there are added many more, say five times as many, sterile males, then the chances of a

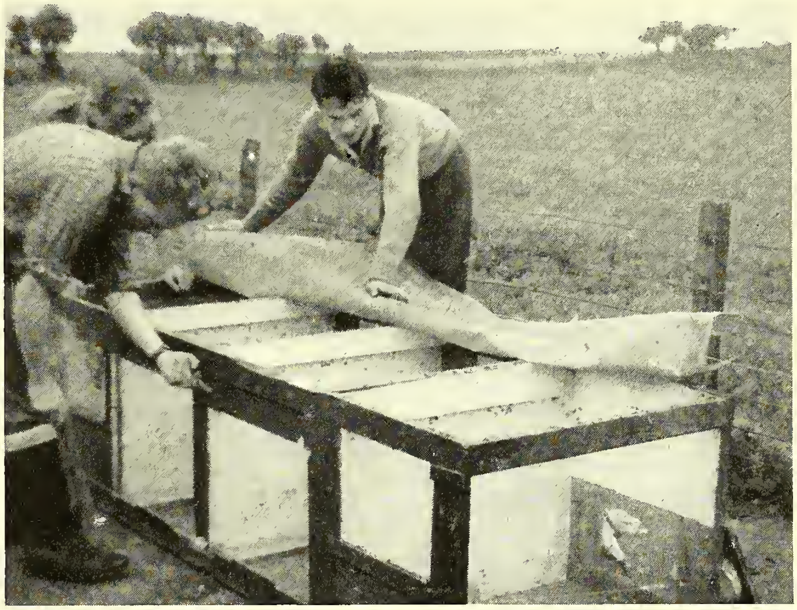
The only approach road to the village on Holy Island along the sandy shore below high-water mark.

A line of blowfly traps for sampling a field. To avoid interference by stock each trap is protected by a metal carboy carrier.

Holy Island field test



The "release trays" in which successive batches of irradiated pupae were placed under a cover of peat-dross, and from which sterile sheep-blowflies continued to emerge at different points on the Island.



Releasing flies from a set of cages in which many thousands of experimentally treated flies had been maintained. A few flies have not yet taken flight.

Making sheep chemically attractive to the sheep-blowfly, to test for presence of residual native flies on the Island.

Setting out blowfly traps baited with pieces of meat.

female receiving a fertile impregnation will be only 1 to 5; in 5 out of 6 instances she will be inseminated with sterile sperm, and so her eggs will not hatch. The size of the next generation should therefore be only one-sixth of what it would normally, be, and if the numbers of sterile males are kept at their original level by replacement of natural wastage, the proportion of non-sterile to sterile males should be only 1/6 to 5, or 1 to 30. The females, now only one-sixth of the normal numbers, having only a 1 to 30 chance of fertile insemination, the second generation after sterile males are first released is only 1/186 of the original, and the virgin females in that generation have only a 1 to 930 chance of reproducing. The third generation is thus reduced to 1/173,166 of the original level, and so on.

Screw-worm flies are usually in relatively low density—some hundreds per square mile; the chances of any progeny being produced by the second generation under those conditions should therefore be remote, and if any lone females were to reach maturity their chances of mating with the similarly rare fertile males should be infinitesimal.

In fact, the species was apparently eradicated from the 170-square-mile island of Curaçao within five months by the release of sterile males at the rate of 400 per square mile per week. The experiment has been of great importance, since in addition to demonstrating that the theory does work in practice, it has shown that eradication by this method can be a practicable proposition from the technical and logistic points of view.

The potential importance of the method lies in the facts that (a) the control is specific—only the species in question suffering the frustration of sterile mating—and there is no danger of the weapon getting out of control and attacking other targets, as in the case of released predators or parasites; (b) as the surviving remnants dwindle, the pressure on them becomes increasingly great, instead of decreasing. Thus, the two stated objections to the earlier type of biological control no longer apply, nor does the " blunderbuss " criticism of the method of broadcast insecticides.

Limitations of the Technique

That the method has distinct limitations is not denied. The population to be attacked must obviously be in sufficiently low density to make the rearing of a preponderating sterile population feasible. The males of the species must be capable of withstanding sterilisation without having their vitality and ability to mate seriously impaired, and the habits of the species must be such that the sterilised males can be readily distributed through the native population. Finally the females must accept, and be satisfied by, insemination by the sterile males.

The method would be difficult to apply in the case of a species which was harmful in the adult stage, since it involves a marked if temporary increase in numbers of adults. In the case of the screw-worm, it is only the larvæ that is harmful. It was thus not necessary to separate and retain the females emerging from the sexless pupæ, since, in themselves innocuous, they had, like the males, been rendered sterile, and so were incapable of laying eggs even though they might chance to be inseminated by fertile males. That tremendously simplified the work.

The success of the American screw-worm work raises the exciting possibility of similarly controlling many awkward enemies that have not succumbed to attack by other methods. The possibility of sterilising tsetse flies, carriers of the killing trypanosomiasis of man and animals in Africa by irradiation of pupæ, has been confirmed experimentally, but the technical difficulties of applying the method to the control of tsetse in nature are considerable. No confirmation of the value of the method in the field has so far been obtained with any insect other than the screw-worm. An experiment at eliminating the sheep maggot-fly gave disappointing results. It was found that that species also could be sterilised in the pupal stage by a dosage of gamma rays that did not markedly reduce the vitality of the adult fly. In 1956-57 a field test was made on Holy Island, off the Northumberland coast. On that two square miles of land lying about a mile off-shore, the native population of maggot-flies was estimated as being in the region of one or two thousand only. A population of about 20,000 sterile flies, i.e., about 10,000 males, was established in early July, and maintained by weekly additions until the end of the blowfly season in early October. The initial liberation in 1957 was of almost 20,000 males, and the population was maintained at over 10,000 males by twice-weekly additions until near the end of September. The consistent poor weather of those two summers prevented assessment of progress during the actual experiment, but tests in early summer of 1958 showed that fertile flies were as common on the Island as on the adjacent mainland.

That unexpected result is to the good in that it gives early warning of the need for careful study of all possible factors that may effect the result when the method is applied in the field. The causes of the Holy Island failure are not yet known but, whatever they may turn out to be, the fact remains that the American success marks the birth of a new era in insect control, and—who knows?—perhaps the beginning of the end of the present phase of defensive fighting, which began long before the Christian era, in a war which is as old as man.

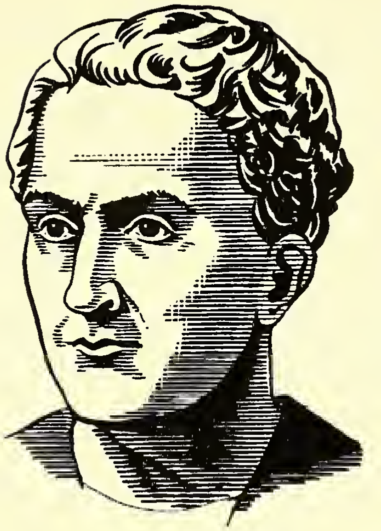
Homeward Musings

WITH feelings approaching complacency, combined with musings of a historical kind, I took my way home from the pharmacy the other night. In my professional duties that day I had spanned the centuries, calling up the accumulated knowledge of medicine and pharmacy from the time of Sydenham or Mead to these modern days of . . . but ethical considerations forbid me to mention contemporary names. In the short space of one hour I had dispensed pills of valerian and a modern tranquilliser with a fearsome chemical name. There was here material for fancy. In imagination I saw a physician of old, bewigged and carrying a gold-headed cane, entering Lombard Street and seeking out a narrow opening called Change Alley—" a narrow sound, though deep as hell," as Swift described it. I saw the fashionable physician making his way to Garroway's coffee house, where important consultations are afoot. The great man's advice is sought by the apothecaries on the treatment of patients whom he will, in all probability, never see. For a hypochondriac, he prescribes a " cephalic tincture."

The apothecary and I thus tread the same path. My reflections lead on to the differences as well as the similarities of that path. Much as I am inconvenienced in my daily encounters with the modern physician by his predilection for the newest proprietary preparations not yet in stock, I feel relieved that my prescription of the morning demanded a simple valerian pill and not the cephalic tincture prescribed at Garroway's. That would have involved me in substantial fetching and carrying, for though I have valerian in various forms, I have not at hand supplies of paeony root, mistletoe of the oak, still less peacock's dung.

My musings on the inveteracy of certain medicaments prompted me to reflect that the departure of my generation may sever a link with Garroway's, for I have in my time dispensed calendula, canella, cinchona, euphorbium, guaiacum, myrrh and scammony, some of which, indeed, were well known centuries before Garroway advertised that he had tea to sell—the first tea to be sold in England—at prices ranging from sixteen to fifty shillings the pound.

Absorbed by such reflections my attention became somewhat diverted from reality, for how could one so preoccupied be aware that he carried with him olfactory evidence of what had occupied him during the day ? Fellow-travellers in a crowded coach on a warm evening could scarcely guess at the romantic visions in the mind of one from whom seemed to emanate a pervading aroma of an unusual kind, but they were very kind. They gave me as much room as they could for my contemplation.—*Valerie Diction.*



Galen Reappraised

AN ASSESSMENT OF HIS INFLUENCE ON CURRENT PHARMACEUTICAL THOUGHT

Leslie G. Matthews

TO the pharmacist Galen is no new name. Though galenicals—" a remedy such as Galen prescribed" (O.E.D.)—may be disappearing from our pharmacopœias and formularies, sufficient are retained in the 1958 B.P. to justify, if justification were needed, the retention of practical pharmacy as a compulsory subject in the pharmaceutical curriculum. The Pharmaceutical Society has as yet no cause to replace the supporters on its coat, Galen and Avicenna, by an organic chemist and a microbiologist.

Early Influences

Galen (A.D. 130–31 to 200–01) lived in a period when the Roman Empire flourished as perhaps at no other time. Born in Pergamon (modern Turkish Bergama, in Turkish Asia Minor, an inland City some 80 miles N.E. of Smyrna), the centre of an undisputed Hellenistic tradition and cult, his youth was surrounded with an atmosphere of medicine. The famous medical temple, the Asclepieion, across the river from the City, was at once a college, a shrine, and a centre of healing, not least the kind of healing known as " temple incubation," where the sick, during sleep, might expect cure from a visitation of the God during the night. It was because of a dream in which Asclepios appeared to Galen's father that medical studies became the youth's choice. First anatomy in Pergamon, then further study in Corinth and Alexandria, where medicine and philosophy attracted him. (It is only by Galen's quotations of the works of notable Alexandrian teachings that books lost to the world are known at all.) Rome was Galen's goal and he achieved it about the time (A.D. 161–62) when the Emperor Marcus Aurelius and his brother succeeded their father Antonius Pius. Sarton[1] refers to it as " the heyday of the Empire, and Rome was a brilliant capital, opening golden opportunities to Greek physicians." Of those opportunities Galen took full advantage, both in the practice of medicine and by writing the almost innumerable books on all facets of human life in health and disease—anatomy, foods, hygiene, medicine, pharmacy and therapeutics, to pick out only a few of the titles, not to mention two versions of an autobiography (Kuhn's edition of Galen's Works runs to twenty-two volumes, with an index of 676 pages!)[2] Many of these are known to the Western world only by Arabic translations, and their readvent in the Renaissance continued the Galenic influence well into the eighteenth century.

What was the teaching of Galen that it endured so long, and why have medicine and pharmacy paid it so much respect ? First of all he saw life as a whole, the integration of man sound in mind and body. As he wrote in *De Sanitate Tuenda* (Green's translation)[3] " Both in importance and in time health precedes disease. Consider first how health may be preserved and then how one may best cure disease." Compare Professor W. L. M. Parry's[4] assertion (October 1958) that whereas the emphasis in the teaching and practice of medicine had been on the treatment of disease, the future lies in the adoption of preventive measures as the basis of medicine. There was not much wrong with the second-century teaching in that respect!

Prerequisites of Diagnosis

Galen insisted on as complete knowledge of his patients' circumstances and conditions as possible before arriving at a diagnosis. He deplored the " spot " diagnosis though he was himself fortunate when other physicians had failed to cure the Emperor Marcus Aurelius. Galen, noticing that he was feverish, formally felt the pulse, and diagnosed the cause of the fever as undigested food—adding greatly to his reputation with the Emperor. He savoured the teachings of the various medical sects of his time, the Hippocratists—he quotes many of the aphorisms—the Dogmatists, the Empiricists, and the Methodists, but declined to ally himself specifically with any, though he asserted his views in such a way that many considered him as dogmatic as the sect he criticised.

The theory of humours—deriving from Hippocrates—he accepted, and in *Pericrasion, De Temperamentis,* it was so well formulated, says Sarton[5] " that that treatise remained the standard authority on the subject for fifteen centuries or more " and we still use the adjectives sanguine, choleric, melancholic, phlegmatic in describing temperaments, though our views on the relation of dry, wet, cold and hot, or the humours of the body, blood, yellow bile, black bile and phlegm have changed, and medicines affecting them have long since ceased to be the physicians' armamentaria.

An Advocate of Moderation

Galen's view on massage, as both a restorative and an ameliorative, were soundly based, partly, no doubt, by reason of his considerable experience as physician and surgeon to the gladiators in Pergamon. He was a great exponent of the use of medicated oils, both for increasing weight in the thin person or for reducing the corpulent, as well as for getting rid of what he described as " fluids in the flesh or skin." He was an advocate of moderation in all things. Regarding old age he had ideas that would be acceptable today. He saw the need for old men to keep their body active, but coupled that with the caution that the old man, while exercising in the way in which he was accustomed, should give up the intense form of his activities. Not every elderly gentleman could accept his doctrine of massage each day at dawn, and even Galen himself says that " it is exceedingly difficult to get them to do this properly." On the other hand he would suggest to the ageing diner-out that he should take exercise and, if he liked a good table, to have abundant food of little nourishment—a recommendation that modern dieticians and perhaps modern advertisers may unwittingly have seized upon in promoting low-calorie, but filling, foods. His comforting word to the aged was that they should have what is beneficial to their constitution. A philosopher(!) of the Edwardian days said (or sang) it rather differently: " A little of what you fancy does you good."

There are complaints nowadays of the multiplicity of identical active ingredients issued under different names. That is something that must have vexed both prescriber and compounder from Galen's time onwards. It was everybody's business to bring out a new formulary. Copying from each other, the new Formularists either followed faithfully or added a new drug or two to a compound preparation.

Wootton[6] gives an example of this under Hiera Picra. First employed, reputedly, in Aesculapian temples, its formula was attributed to Themison of Laodicia (aloes, mastic, saffron, Indian nard, carpabalsamum, and asarum). A variant (of Archigenes) then modified by Galen, by transposition and alteration finally came into the Pharm. Lond. of 1618 where it remained until 1758 as a mixture of aloes and canella under the title of Pulv. Aloeticus, though also appearing in the Index as " olim Hiera Picra." In Galen's *De Sanitate Tuenda*, quoted above, he cautions against overuse of aloes (rolled into pills with cabbage juice) or, as used by the rich, aloes with cinnamon (canella) called " sacred aloes."[7] Hiera Picra remained in the pharmacy as pill or stick for the pharmaceutical apprentice to prepare until the 1920's, and may in some districts still be demanded.

The varieties of a preparation that an apothecary of the fifteenth century in Basle[8] was expected to be ready to prepare is shown by the range of Formularies he must have in his library: the books of Mesuë junior, Avicenna, Serapion junior, Dioscorides, the Macer Floridus, the Circa Instans, the Synonyma Medicinæ of Simon Januensis, besides the Antidotarium magnum and parvum of Nicolai. In many of those the formula was merely an elegant variant of its predecessor.

On pharmacy proper Galen exercised a beneficial and continuing influence. He insists on care in choice of ingredients, in formulation, and in method of preparation. The identification of natural drugs and the tests for adulteration that would be stipulated by the botanist or pharmacognosist, and the specification of operating temperatures and analytical control, now part and parcel of pharmaceutical manufacture, are of course lacking, but enough examples remain of the thoroughness of Galen's learning and of his appreciation of the fact that, to get good results, only the best drugs and those grown in the best locations would serve the interests of both physician and patient.

Take, for example, his directions for preparing " diacalaminth," a compound preparation for a patient of an ulcerous disposition. The quantities of ingredients are stated: 2 oz. each of calaminth, pennyroyal, rock-parsley, and sesely; 4 oz. each of parsley seed and thyme spikes; 16 oz. of libysticum and 48 of pepper. The calaminth and pennyroyal had preferably to come from Crete; if not obtainable from Crete then from high and woody places. That applied also to the thyme—but the thyme spikes had to be stripped, only the thin tender terminal leaves, with the flower spikes and tiny fruits, were to be used, the woody parts being discarded. The rock-parsley must be from Macedonia, " and then of the Astreolite kind," and the pepper had to be the variety known as " heavy " (pepper in large quantities was a staple prescription of Galen). For the preparation of oils for massage, using pine seed as the active ingredient, he is careful to say that the seed shall be gathered in September (when maximum oil content may be expected), then to be macerated in oil, but crushed first so that the seed the more effectively yield its properties. Water baths for proper heating are to be used—an exterior pan of boiling water, containing the interior pan of the heating oil, straining the whole through muslin afterwards, and being careful not to overheat, or diluting to prevent burning, and finally reducing the residual liquid to a proper consistence.[9] Those who had little success in preparing lin. terebinth. when that medicament was an everyday requirement will know how necessary exact directions are and how manipulation can affect the final product.

Galen was so exacting in his choice of medicines that he kept his own stock of drugs. He was for the experimental method—one of the few of his time who understood the need of it, recognising, however, that it was a hard and lengthy road even though it would lead to the truth.[10] That view has long been commonplace in medicine. Professor Hill recently commented that " in the proper understanding of its (the body's) functional capabilities and limitations, there is need for first-class brains because, in the biological field, the data are much more intractable than are those in the inorganic field."[11]

As for Galen's fundamental philosophy, though living in a period when the Christian religion had gained a strong foothold he was not able to accept that new doctrine. He remained what we would term a pagan, but, as Sarton concludes: " Galen's religion was so secure in his soul that the beliefs of other people could hardly touch him."[12]

Grasp of the Realities

The more Galen's writings are studied, the stronger is seen to be his grasp of the realities of medicine: no blind follower of his forerunner, he was an experimenter who became a leader of medical thought and an influence upon both medicine and pharmacy longer than any of his successors. In our age, however, whilst " the mixture " (of mankind in health and disease) remains, the rapid changes in prophylaxis and treatment ensure that it cannot be " as before."

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[1] Sarton, George. " Galen of Pergamon," Kansas, 1954. 20–21.

[2] Translations of Galen's works into English are still few in number, even including those made in the seventeenth century. Unfortunately the " Galen Society " proposed by Dr. Charles H. Singer did not become established. One of its objects would have been a complete English version of Galen's writings.

[3] Robert M. Green. Galen's Hygiene, Springfield, Illinois. 1951. s.

[4] Inaugural lecture, University of Edinburgh. THE CHEMIST AND DRUGGIST, 1958. **2.** 438.

[5] op. cit 53

[6] Wootton, A. C. " Chronicles of Pharmacy " (THE CHEMIST AND DRUGGIST), London, 1910. **II.** 138–42.

[7] Green, op. cit 216.

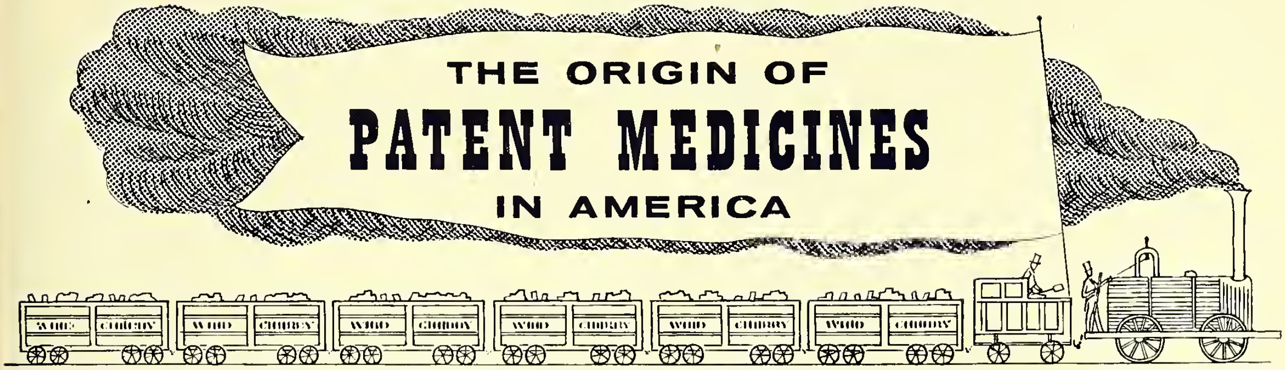
[8] Haefliger, J. A., *Pharm. Acta Helvetiæ*, 1927. I.

[9] Green, op, cit. pp. 170-72.

[10] Sarton, op. cit. 48.

[11] Nature, 182. **4642.** 1065.

[12] Sarton, op. cit. 87.



THE ORIGIN OF PATENT MEDICINES IN AMERICA

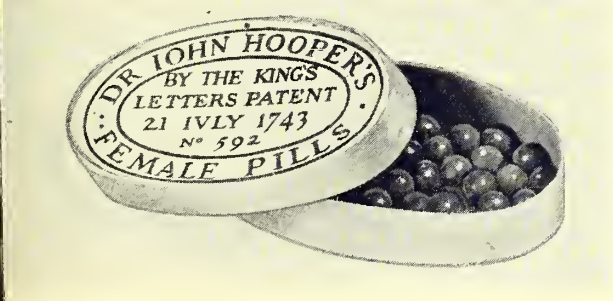
JAMES HARVEY YOUNG (*Professor of History, Emory University, Atlanta, Georgia, U.S.A.*)

AMERICAN independence in politics and American independence in packaged medicines came hand in hand. As part of the great fire of cultural nationalism, kindled during the Revolutionary War and fanned into higher flame by the pride of victory, the United States gloried in new American textbooks, American maps, American Bibles, American inventions. And Americans began to dose themselves increasingly with drug concoctions mixed on their own shores and ballyhooed with boastful Yankee ingenuity.

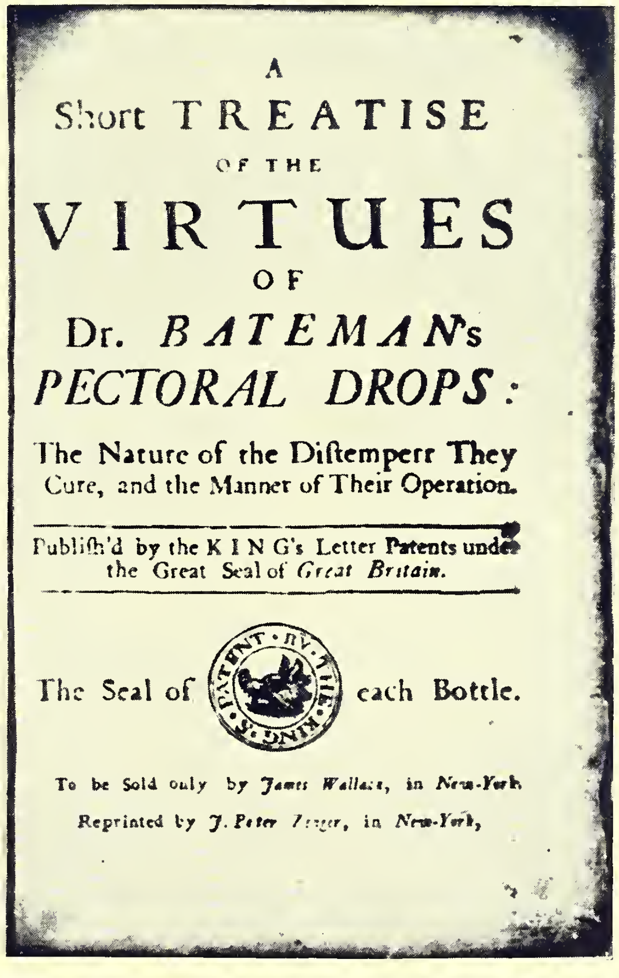
Just as the political structure of the United States owed debts to its British colonial past, so too did American patent medicines. The saga of the old English patent medicines in America was told in these columns two years ago.[1] Eighteenth-century Americans were familiar with a score or more of British nostrums, most of them vended in bottles of distinctive shape covered with wrappers closely printed to tell of wondrous cures that had been performed and still might be expected. Many issues of the small American newspapers bore advertisements like that of the Philadelphia apothecary who announced in 1768 as "Just imported from London" and for sale "At the Golden Mortar, opposite Black-Horse Alley" a long list of patent medicines, including "Anderson's, Hooper's and Lockyer's pills, Bateman's drops, British oil, Bostock's, Squire's and Daffy's elixirs, Stoughton's bitters, Turlington's balsam of life, Dr. James's fever powders, Godfrey's cordial."[2]

A Miscellany of Vendors

It was not only apothecaries who sold those medicines, which reached every American port from the warehouses of major exporters in Lombard Street and in St. Paul's and Bow Churchyard. The English nostrums were also put into the hands of America's ailing by postmasters, booksellers, hairdressers, tailors, printers, goldsmiths, and many physicians as well. Colonial salesmanship, to judge by advertising, was drab compared with the brazen promotion in the mother country. None the less, the advertising was so extensive



Hooper's Female Pills, patented July 21, 1743, one of the most persistent of the old English remedies. Original package shown here from the private collection of Samuel Aker, David and George Kass, Albany, New York, U.S.A.



A
Short TREATISE
OF THE
VIRTUES
OF
Dr. *BATEMAN*'s
PECTORAL DROPS:

The Nature of the Diſtempers They
Cure, and the Manner of Their Operation.

Publiſh'd by the KING's Letter Patents under
the Great Seal of *Great Britain*.

The Seal of each Bottle.

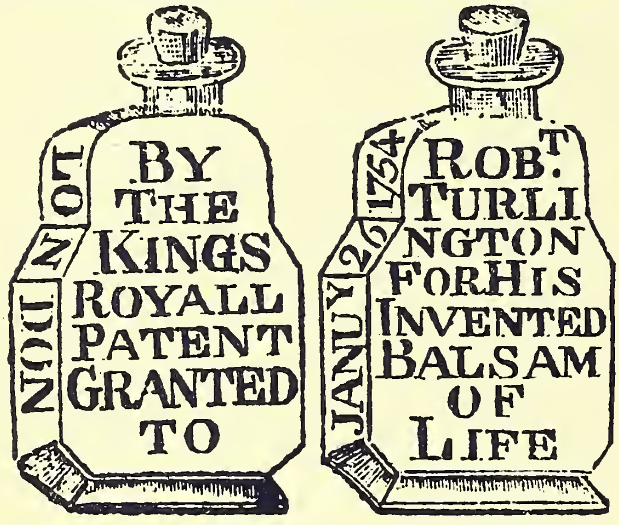
To be Sold only by *James Wallace*, in *New-York*.
Reprinted by *J. Peter Zenger*, in *New-York*,

Title-page of a pamphlet reprinted in New York in 1731 from an earlier English edition in behalf of Bateman's Pectoral Drops. Original preserved in the New York Academy of Medicine Library, New York City, New York, U.S.A.

Illustrations from "Old English Patent Medicines in America" (*C. & D.*, June 29, 1957).

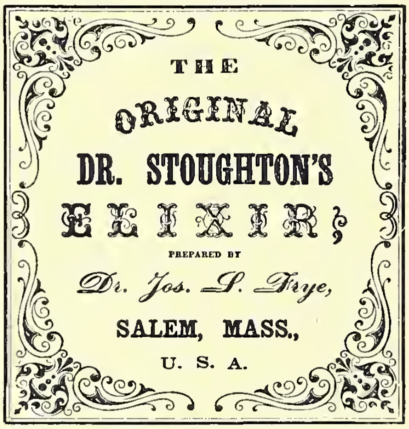
geographically, and so persistent chronologically, that there is no question but that the old English pills and drops played a significant rôle in eighteenth-century American therapy.

Why did not some shrewd colonial, observing the steady sales of British proprietaries, and sensing the gold that might lie at the end of such a rainbow, launch a competitive home-grown remedy? The answer is that there were indeed fumbling efforts heralding the day of native American nostrums. Yet, prior to the Revolution, no American *entrepreneur* managed to offer a real challenge to Bateman's pectoral drops or Hooper's female pills.


LONDON
BY THE KINGS ROYALL PATENT GRANTED TO
JANUY 26 1754
ROBT TURLINGTON FOR HIS INVENTED BALSAM OF LIFE

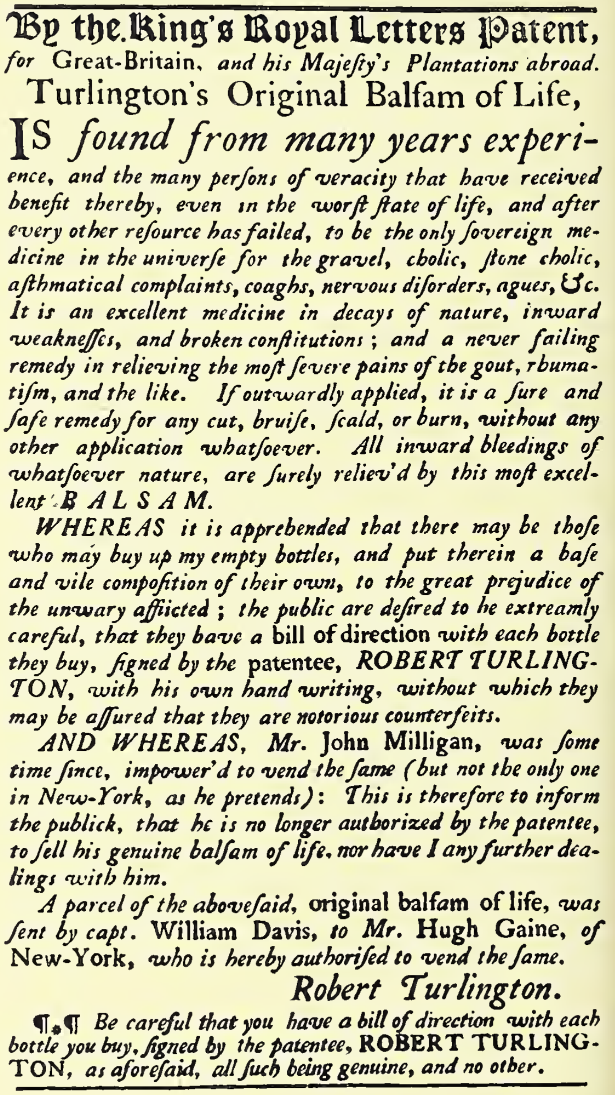
The distinctively shaped bottle of Turlington's Balsam of Life as pictured in a brochure circulated in America. The original is preserved in the Historical Society of Pennsylvania, Philadelphia, Pa., U.S.A.

Upper and lower illustrations from "Old English Patent Medicines in America" (*C. & D.*, June 29, 1957).


THE
ORIGINAL
DR. STOUGHTON'S
ELIXIR;
PREPARED BY
Dr. Jos. S. Frye,
SALEM, MASS.,
U. S. A.

Label for an American-made version of Stoughton's Elixir as prepared by Dr. Jos. Frye of Salem, Massachusetts. The label is preserved in the files of the Essex Institute, Salem, Mass.

One minor display of colonial American venturesomeness lay in the imitation of the popular English medicines. That gesture was really an imitation of an imitation, for from the start in England bold merchandisers had marketed counterfeit versions of successful nostrums. No advertising wail was so loud as that of the outraged proprietor warning the public against his rascally transgressor. No fight was more bitter than that between rivals selling pills of the same name, each pill man seeking to persuade the world of his own priority. The Stoughton heirs, for example, pursued their family feud over the elixir in print. A son and a daughter-in-law both claimed the formula. The latter called the former a crook, and the former blamed the latter for having run through two husbands already and for eagerly wanting a third. As the battle raged, a third combatant spoke up. She was no Stoughton—although a widow—and her appeal to the public rested on a strange foundation: that her late husband had infringed Stoughton's patent until forbidden by the Lord Chancellor.


By the King's Royal Letters Patent,
for Great-Britain, *and his Majeſty's Plantations abroad.*
Turlington's Original Balſam of Life,

IS *found from many years experience, and the many perſons of veracity that have received benefit thereby, even in the worſt ſtate of life, and after every other reſource has failed, to be the only ſovereign medicine in the univerſe for the gravel, cholic, ſtone cholic, aſthmatical complaints, coughs, nervous diſorders, agues, &c. It is an excellent medicine in decays of nature, inward weakneſſes, and broken conſtitutions; and a never failing remedy in relieving the moſt ſevere pains of the gout, rheumatiſm, and the like. If outwardly applied, it is a ſure and ſafe remedy for any cut, bruiſe, ſcald, or burn, without any other application whatſoever. All inward bleedings of whatſoever nature, are ſurely reliev'd by this moſt excellent BALSAM.*

WHEREAS it is apprehended that there may be thoſe who may buy up my empty bottles, and put therein a baſe and vile compoſition of their own, to the great prejudice of the unwary afflicted; the public are deſired to be extreamly careful, that they have a bill of direction *with each bottle they buy, ſigned by the* patentee, *ROBERT TURLINGTON, with his own hand writing, without which they may be aſſured that they are notorious counterfeits.*

AND WHEREAS, Mr. **John Milligan**, *was ſome time ſince, impower'd to vend the ſame (but not the only one in New-York, as he pretends): This is therefore to inform the publick, that he is no longer authorized by the patentee, to ſell his genuine balſam of life, nor have I any further dealings with him.*

A parcel of the aboveſaid, **original balſam of life**, *was ſent by capt.* **William Davis**, *to Mr.* **Hugh Gaine**, *of* New-York, *who is hereby authoriſed to vend the ſame.*

Robert Turlington.

¶*¶ *Be careful that you have a bill of direction with each bottle you buy, ſigned by the patentee,* ROBERT TURLINGTON, *as aforeſaid, all ſuch being genuine, and no other.*

A dispute over American rights in the sale of the old English favourite, Turlington's Balsam of Life, is revealed in this advertisement from the New York Mercury, *November 9, 1761.*

Courtesy of the Library of Congress, Washington, D.C., U.S.A.

Nothing quite so gaudy took place in America. But late in the colonial period American apothecaries began to import from England empty vials in the standardised shapes known to customers who dosed themselves with Stoughton's and Daffy's elixirs. Printed wrappers were ordered, too. The problem of what to put in the vials was not difficult. Formulas for both of those remedies had become official in the London and Edinburgh pharmacopœias, as well as in many popular medical handbooks for the layman, like the *Primitive Physic* compiled by the founder of Methodism, John Wesley. Much variation developed as the practice of filling empty bottles went on apace. But the American customer, since bottle shape and wrapper looked familiar, doubtless was seldom aware that his English healing draught was being brewed on colonial shores.

A New York newspaper feud of 1760 and 1761 rivalled the London battles in intensity. And well it might, for one of the participants was Robert Turlington, the English patentee and proprietor of the popular balsam of life. He entered the lists late, after a handful of merchants had advertised his balsam for sale. They numbered among them one woman, a man at the Woman's Shoe-Store, and three male apothecaries, one doing business at the Sign of the Bell, another "at the Sign of the Looking-Glass and Drugist-Pot." There was much disputation as to who had on his or her shelves the authentic article. The situation became so confusing to consumers that Turlington himself, alert to what was going on in America, decided to step in. In the pages of the *Mercury*, he warned against counterfeiters, "those who may buy up my empty bottles, and put therein a base and vile composition of their own." He denied that the Shoe-Store man had an exclusive franchise and, indeed, cut him off without another genuine vial. And Turlington announced that he had sent a parcel of his potent remedy to be vended by the editor of the *Mercury*.[3] Imitating British patent medicines might reveal a spark of American alertness but hardly the full flame of true originality.

American quackery dates back to 1630, when Nicholas Knopp, a resident of Massachusetts Bay, was fined £5 or whipped for vending as a cure for scurvy "a water of no worth nor value, which he solde att a very deare rate."[4] How Nicholas marketed his water is not known, but certainly not with the exaggerated printed promotion that attended the origin in the same century of the English nostrums. Nor did Americans, during the colonial years, ever achieve either the flamboyant advertising in Press and pamphlet or the distinctive packaging that characterised patent medicines in the mother country.

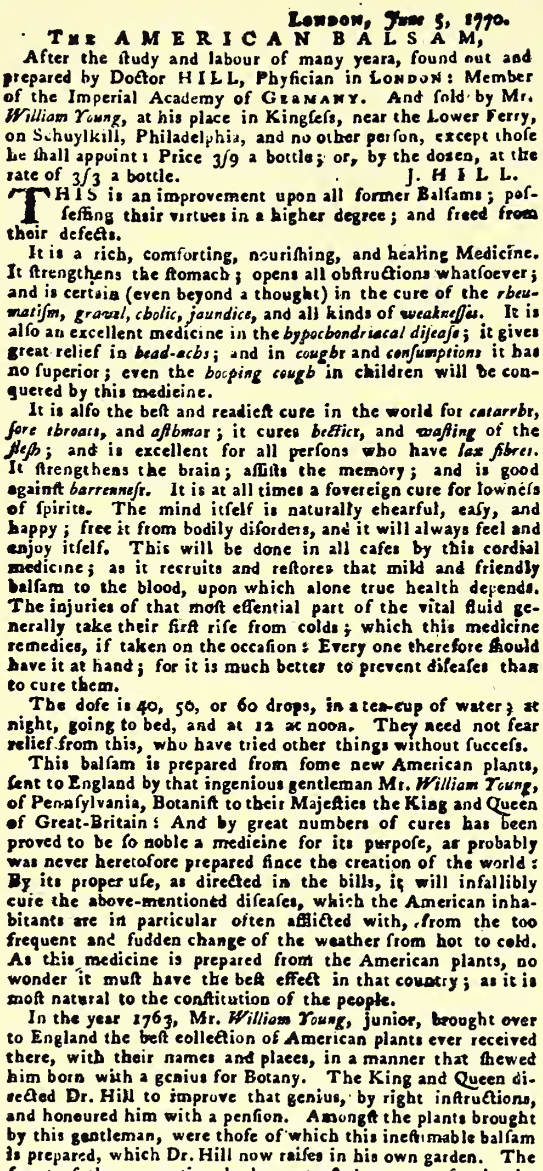
A Masquerader

Many mountebanks wandered about the colonies persuading the gullible to purchase their panaceas. One Charles Hamilton, for example, appeared in Chester, Pennsylvania, boasting of his excellent education and marvellous remedies. Somehow the townspeople got suspicious and the pretender was examined. He was found to be a woman, and Charlotte Hamilton was put in jail. Another itinerant, calling himself Francis Torres, showed up in Philadelphia selling Chinese Stones to cure the bites of mad dogs and rattle-snakes, toothache, cancer and ulcerated legs. A fortnight later, one Acidus gave advice in a local paper to the poor who could not afford Monsieur Torres's charge of twenty-five shillings. ". . . go to a Cutler's Shop," the critic advised, "there you'll find a Remnant of the Buckshorn, cut off probably from a Piece that was too long for a Knife Handle, saw and rasp it into what shape you please, and then burn it in hot Embers; and you will have Mons. Torres's Chinese Stone. . . ."[5] Torres showed up in other colonial cities and advertised his potent pebbles. But, unlike many British contemporaries, he did not settle down in one city, wrap portions of his remedy in identical packages, ship it to shops in other towns, and advertise its curative blessings in numerous papers simultaneously.

At right:

An English nostrum, prepared from transplanted American flora, comes back to heal America's ailing. Pennsylvania Gazette, *October 11, 1770.*

Courtesy of the Library of Congress.



London, June 5, 1770.

THE AMERICAN BALSAM,

After the ſtudy and labour of many years, found out and prepared by Doctor HILL, Phyſician in LONDON: Member of the Imperial Academy of GERMANY. And ſold by Mr. *William Young*, at his place in Kingſeſs, near the Lower Ferry, on Schuylkill, Philadelphia, and no other perſon, except thoſe he ſhall appoint: Price 3/9 a bottle; or, by the dozen, at the rate of 3/3 a bottle. J. HILL.

THIS is an improvement upon all former Balſams; poſſeſſing their virtues in a higher degree; and freed from their defects.

It is a rich, comforting, nouriſhing, and healing Medicine. It ſtrengthens the ſtomach; opens all obſtructions whatſoever; and is certain (even beyond a thought) in the cure of the *rheumatiſm, gravel, cholic, jaundice*, and all kinds of *weakneſſes*. It is alſo an excellent medicine in the *hypochondriacal diſeaſe*; it gives great relief in *head-achs*; and in *coughs* and *conſumptions* it has no ſuperior; even the *hooping cough* in children will be conquered by this medicine.

It is alſo the beſt and readieſt cure in the world for *catarrhs, ſore throats*, and *aſthmas*; it cures *hectics*, and *waſting* of the *fleſh*; and is excellent for all perſons who have *lax fibres*. It ſtrengthens the brain; aſſiſts the memory; and is good againſt *barrenneſs*. It is at all times a ſovereign cure for lowneſs of ſpirits. The mind itſelf is naturally chearful, eaſy, and happy; free it from bodily diſorders, and it will always feel and enjoy itſelf. This will be done in all caſes by this cordial medicine; as it recruits and reſtores that mild and friendly balſam to the blood, upon which alone true health depends. The injuries of that moſt eſſential part of the vital fluid generally take their firſt riſe from colds; which this medicine remedies, if taken on the occaſion: Every one therefore ſhould have it at hand; for it is much better to prevent diſeaſes than to cure them.

The doſe is 40, 50, or 60 drops, in a tea-cup of water; at night, going to bed, and at 12 at noon. They need not fear relief from this, who have tried other things without ſucceſs.

This balſam is prepared from ſome new American plants, ſent to England by that ingenious gentleman Mr. *William Young*, of Pennſylvania, Botaniſt to their Majeſties the King and Queen of Great-Britain: And by great numbers of cures has been proved to be ſo noble a medicine for its purpoſe, as probably was never heretofore prepared ſince the creation of the world: By its proper uſe, as directed in the bills, it will infallibly cure the above-mentioned diſeaſes, which the American inhabitants are in particular often afflicted with, from the too frequent and ſudden change of the weather from hot to cold. As this medicine is prepared from the American plants, no wonder it muſt have the beſt effect in that country; as it is moſt natural to the conſtitution of the people.

In the year 1763, Mr. *William Young*, junior, brought over to England the beſt collection of American plants ever received there, with their names and places, in a manner that ſhewed him born with a genius for Botany. The King and Queen directed Dr. Hill to improve that genius, by right inſtructions, and honoured him with a penſion. Amongſt the plants brought by this gentleman, were thoſe of which this ineſtimable balſam is prepared, which Dr. Hill now raiſes in his own garden. The ſecret of the preparation he has entruſted to no perſon in the world; but, in gratitude to the young gentleman, has appointed his father, Mr. *William Young*, ſenior, of Kingſeſs, near Philadelphia, the only capital vender of them in all America, appointing whom he pleaſes under him.

. I, the ſubſcriber, hereby give notice, that I have appointed, in Philadelphia, *Footman & Jeyes, Bayard & Jackſon*, and *William Sitgreaves*, to ſell the above balſam for me, at their ſtores or vendue houſes, either by private or public ſale, as they may think the moſt convenient for the people. Dr. Hill has wrapt the bottles in bills, how the medicine muſt be uſed, of which the above advertiſement is a copy; and he has ſignified to me in a letter, that the price mentioned in the bills was meant ſterling money; but, as he is a great friend to his fellow ſubjects in America, and to do good to all mankind, is more to him than great profits for preparing his medicines, conſidering that thoſe who buy ſaid balſam by the quantity to ſell again, ſhould have good encouragement, and a reaſonable profit allowed; and that the poor may be able to buy them, as well as the rich, he has ordered me to ſell them for the price mentioned in the bills, in Pennſylvania money; and that the ſhop-keepers, and others, in Philadelphia, who buy to ſell again, might have about a Shilling profit on each bottle; and maſters of veſſels, who may intend to carry them to other parts of America, ſhop-keepers, and others, who live far in the country, or other provinces, who may have greater expences, may there ſell ſaid balſam, for the price mentioned in the bills, for the value in ſterling money. And as Dr. Hill is very well known, and all his former medicines are in very high eſteem in almoſt all the world, no doubt this excellent balſam will ſell very quickly.

Kingſeſs, Oct. 1, 1770. WILLIAM YOUNG, ſenior.

Local Salesmanship

Nor was such a sophisticated scheme of promotion employed on behalf of other American-made medicines hardly so suspect as Monsieur Torres's wares. Humble men and women, most of them undoubtedly sincere, went into the market place with remedies dredged up from folk medicine, and even advertised them. But the efforts were local, sporadic and limited.

Here is the text of an advertisement from a Philadelphia newspaper under date of August 19, 1731. "The Widow READ, removed from the upper End of Highstreet to the *New Printing-Office* near the Market, continues to make and sell her well-known Ointment for the ITCH. . . . It is always effectual for that purpose, and never fails to perform the Cure speedily. It also kills or drives away all Sorts of Lice. . . . It has no offensive Smell, but rather a pleasant one; and may be used without the least Apprehension of Danger, even to a sucking Infant. . . . Price 2 *s.* a Gally-pot containing an Ounce. . . ."

It may be doubted whether that advertisement cost the ointment-maker a penny, for the newspaper was the *Pennsylvania Gazette*, the publisher was Benjamin Franklin, and the Widow Read was publisher Franklin's mother-in-law.

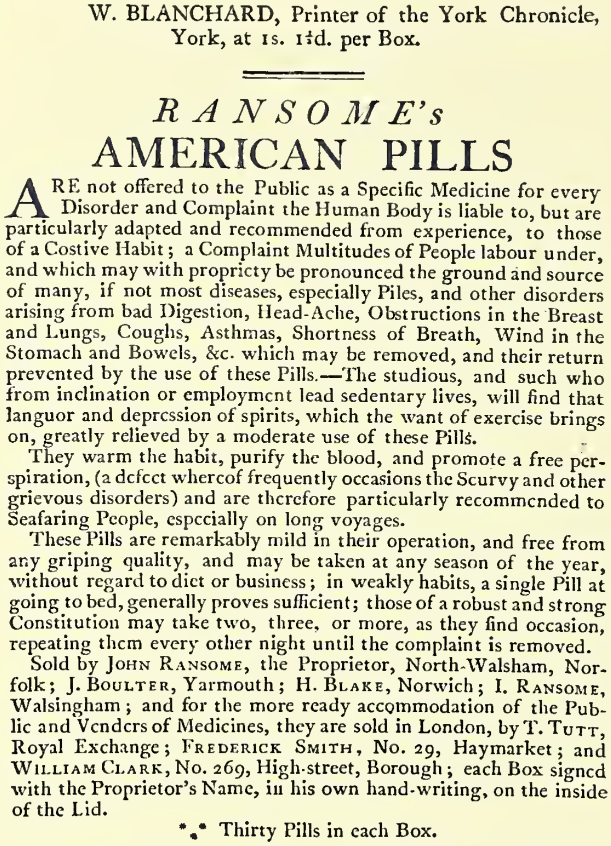
Many of the herbal concoctions in the pharmacopœias had begun in the empirical experimentations of laymen. Nature was continuing to yield her secrets, whether sound or not, to the prying of people of all professions or of none. An interest in one's own health and that of relatives and friends was enough qualification—then as now—to set up in business as a lay prescriber. Traditions handed down, the slightest gift for tinkering, provided dozens of remedies. Almanacs, newspapers, diaries, correspondence, bear testimony to the universal concern over sickness, the widespread interest in cures, and the flood of gratuitous counsel offered on every hand. The line between free health hints and marketed remedies was often crossed, with economic need, perhaps, the major stimulus. The Widow Read may have desired the sense of independence which selling her itch ointment could bring her. Certain "Dutch Ladies" of Charleston may have vended their "Choice Cure for the Flux, Fevers, Worms, bad Stomach [and] Pains in the Head" because that was the only way they could support themselves.[6] Doubtless a similar economic explanation lies behind the cordials of a New York carpenter, the eye-water of a Charleston goldsmith, the cough cure of a Boston grocer.

But seldom do those colonial notices have even the verbal vigour of the Widow Read's announcement. Advertisements for the American remedies are shy and circumspect beside those appearing in England for their bolder British cousins. And compared with Bateman's pectoral drops, the Widow Read's ointment did not get around, even in America.

The colonial years did contain one concoction that has often been termed the first patent medicine in American history. It was named Tuscarora rice and its maker was a woman. First to tell Mrs. Sybilla Masters's tale in print, so far as can be found, was John F. Watson, who in 1844 published his *Annals of Philadelphia, and Pennsylvania, in the Olden Time*. From Indian corn, asserted chronicler Watson, Mrs. Masters prepared her Tuscarora rice which she recommended as a fare especially beneficial for promoting the recovery of consumptive and other sickly persons. In 1711 she went to England with her remedy and her husband to seek her fortune. While there she got a patent. Back in America, Thomas Masters set up a water-mill and a processing plant near Philadelphia to make Tuscarora rice in more abundant quantities.

First British Patent to an American

Such is the substance of Watson's tale. It is indeed true that in 1715 letters patent were granted Masters for "A New Invencon found out by Sybilla his Wife, for Cleaning and Curing the Indian Corn Growing in the severall Colonies in America." That was the first patent granted in Great Britain to anyone dwelling in America. A drawing accompanying the application shows a device for pounding maize in mortars with stamps operated by cog-wheels attached to a large cylinder turned by horse or water-power. There is nothing about the patent to suggest the use to which the ground maize was to be put. Nor does a petition to the officers of Pennsylvania requesting that the patent be recorded refer to the curing of anything but corn. The Master's mill of Watson's account seems to be entirely a case of mistaken identity.[7]



W. BLANCHARD, Printer of the York Chronicle, York, at 1s. 1½d. per Box.

RANSOME's
AMERICAN PILLS

ARE not offered to the Public as a Specific Medicine for every Disorder and Complaint the Human Body is liable to, but are particularly adapted and recommended from experience, to those of a Costive Habit; a Complaint Multitudes of People labour under, and which may with propriety be pronounced the ground and source of many, if not most diseases, especially Piles, and other disorders arising from bad Digestion, Head-Ache, Obstructions in the Breast and Lungs, Coughs, Asthmas, Shortness of Breath, Wind in the Stomach and Bowels, &c. which may be removed, and their return prevented by the use of these Pills.—The studious, and such who from inclination or employment lead sedentary lives, will find that languor and depression of spirits, which the want of exercise brings on, greatly relieved by a moderate use of these Pills.

They warm the habit, purify the blood, and promote a free perspiration, (a defect whereof frequently occasions the Scurvy and other grievous disorders) and are therefore particularly recommended to Seafaring People, especially on long voyages.

These Pills are remarkably mild in their operation, and free from any griping quality, and may be taken at any season of the year, without regard to diet or business; in weakly habits, a single Pill at going to bed, generally proves sufficient; those of a robust and strong Constitution may take two, three, or more, as they find occasion, repeating them every other night until the complaint is removed.

Sold by JOHN RANSOME, the Proprietor, North-Walsham, Norfolk; J. BOULTER, Yarmouth; H. BLAKE, Norwich; I. RANSOME, Walsingham; and for the more ready accommodation of the Public and Venders of Medicines, they are sold in London, by T. TUTT, Royal Exchange; FREDERICK SMITH, No. 29, Haymarket; and WILLIAM CLARK, No. 269, High-street, Borough; each Box signed with the Proprietor's Name, in his own hand-writing, on the inside of the Lid.

⁂ Thirty Pills in each Box.

The American mode in British self-medication. It is not known if anything other than the name was American. The eighteenth-century broadside is preserved in the Rare Book Room of the Library of Congress.

Thus Sybilla is one of the mystery women of American patent-medicine history. Inventive, ambitious, desirous of protecting the fruits of her ingenuity, she is certainly the type of woman who might grind corn, call it rice, and market it as a consumption cure. But the evidence from which Watson derived his tale has not been found. Certainly Tuscarora rice did not make a therapeutic splash like the fountain, long in play, of Turlington's balsam.

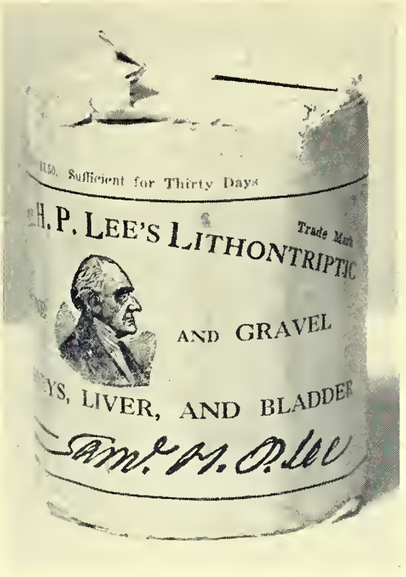
Even the prodding of nascent patriotism in the years leading to the Revolution did not bring forth a real American competitior to the English patent medicines. Advertisements might tell of made-in-New-England mustard, "superior . . . to any imported," and colonial tobacco pipes, "equal in Goodness" to any from abroad, and "American Grindstones . . . esteemed vastly superior to those from Great-Britain, the Grit being smaller."[8] Locally-made hair-restorers and cure-all dentifrices were advertised, but their makers shouldered no patriotic chips. And the English patent medicines, trade conditions permitting, continued to be in ample supply.

"American Balsam"

Oddly enough, the first patent medicine to stress in its name its American origin, a product of the final tempestuous decade before the outbreak of war, was made in England. The proprietor was the vigorous Dr. John Hill whose assortment of nostrums had sold throughout the colonies during the 1760's. In 1770 he put upon the market an American Balsam. Truthfully or not, Hill said that the medicine was made from American plants which had been taken to the king and queen some years before by an American botanist named William Young, jun. The new medicine, its proprietor asserted, would cure everything from whooping-cough to the "*hypochondriacal disease*." Being formed of American plants, "no wonder it must have the best effect in that country." Out of gratitude to young Mr. Young, Dr. Hill declared, he had appointed as the only "capital vender" of the American Balsam in the American colonies the botanist's father.[9]

Comparable ingenuity on the part of Americans themselves did not come until after the fighting was over. It was part of a cultural nationalism that influenced reputable medicine as well as pseudo-medicine. There was a great search by American physicians to discover American herbs which could relieve the American sick of "unrepublican dependence" on European medicines. Efforts were begun to compile an American pharmacopœia. Benjamin Rush, a signer of the Declaration of Independence and most distinguished physician in the new nation, was persuaded that there were twenty times more intellect and a hundred times more knowledge in America in 1799 than there had been before the Revolution.[10]

In that mood made-in-America patent medicines really began. Whereas a 1771 Philadelphia drug catalogue listed no American brands, a New York catalogue for 1804 devoted by far the majority of its eighty to ninety nostrums to American names.[11] The old English remedies, back on the market after the war, were swamped by the rising American tide (and an ever higher proportion of the English patent medicines vended were American-made). The nature of advertising copy was changing, too. Some of that shrewdness and boldness which had marked the prose of Dr. Hill now began to assert itself in behalf of American nostrums. The localism of colonial pitches also gave way, as several proprietors anxious to sell their remedies far and wide began to insert column-long advertisements in scores of the ever more numerous papers. Few colonial products had borne distinctive names—the most vivid in seventy years of the *Boston News-Letter* was The Noble Mummy, and it designated a remedy not for humans but for trees.[12] Now greater ingenuity was displayed, and Sovereign Ointments, Grand Restoratives, and Damask Lip-Salves came on the market. Congress enacted a patent law under the new Federal Constitution, and a few medicine makers looked to government to protect their inventive genius represented in such wonders of medical science as bilious pills. Most promoters, thinking it wise to preserve the secrecy of their formulas, gave the patent authorities a wide berth.



Samuel H. P. Lee went on to make other medicines besides his bilious pills, as this package of his Lithontriptic testifies. It is presumed the portrait bears some resemblance to the Connecticut physician and that the signature is his. Original in author's collection.

During the last few years of the eighteenth century, American ingenuity got fairly launched in the making of nostrums. By 1800 an editor could opine sadly: "Perhaps no past period in the history of this country has teemed with such a multitude of medical mountebanks as the present. The vendors of patent medicines in almost every capital town in the United States are fattening on the weakness and folly of a deluded public."[13]

America's First

The medicine men, of course, put another face on the matter entirely and posed as savers of mankind. Illustrative of this first independent generation of American patent medicine promoters are four men all of whom bore, strangely enough, a surname famous in the annals of American history. The name was Lee.[14]

First in the field was Samuel Lee, jun., of Windham, Connecticut. This Lee won the distinction of being the first American to patent a medicine. In 1796 he applied for and secured governmental protection for an invention that bore the name of "Bilious Pills." The specifications were burned in a patent-office fire, but a later dispensatory gave the ingredients as gamboge, aloes, soap and nitrate of potassa. The list conformed in one respect to a point the proprietor kept repeating insistently: his pills did not contain mercury. Lee was positive as well as negative, and the list of diseases which the pills would cure ran on and on. Guarded by an American eagle, Lee's remedy went forth to battle bilious and yellow fevers, jaundice, dysentery, dropsy, worms, female complaints, and ailments of similar kidney.

William Swaim launched a popular Panacea in the early 1820's, imitating the old English medicines in his use of a bottle of distinctive design. Although this example, from the author's collection, was made almost a century later and comes from St. Louis (whence the trade name had migrated), the bottle design is essentially the same.

Samuel Lee is a shadowy figure, but some traits of his character may be deduced. He had ingenuity, since he was the first American to patent a pill. He possessed vigour, for he made a success of his patent by marketing techniques scarcely exploited by American *entrepreneurs*. He was equipped with imagination, as the cleverness of his advertising attests. One more trait is evident from the scanty record. Samuel Lee had an abundant capacity for indignation. And well he might, for three years after he had begun selling his bilious pills another Samuel Lee began to trespass on his preserve.

Too Much of a Coincidence

Samuel H. P. Lee was a physician who lived in Connecticut, the same state wherein dwelt Samuel Lee, jun. In 1799 this New London doctor secured a patent, and the name of his medical invention was also "Bilious Pills." The coincidence seemed too great. The original Samuel, obviously angry, addressed the public on the subject of his upstart rival. After the launching of his own pills, he wrote, "the demand soon became so great and benefits . . . so amply demonstrated" that the New London scoundrel, thinking to "take advantage of the similarity of names and of the credit of my Pills," obtained a patent. The public needed a warning. "If people incautiously purchase his Pills for mine," Samuel, jun., cautioned, "I shall not be answerable for their effects."

The New London brand was composed of more ingredients than was the Windham brand of bilious pills, the potent mixture containing, according to the dispensatory, aloes, scammony, gamboge, jalap, soap, syrup of buckthorn, and calomel. Samuel, jun., did not let the public overlook Samuel H. P.'s mercury.

The national appetite for bilious pills was obviously enormous. Drug catalogues listed both varieties, and the Connecticut rivals fought each other from nearby newspaper columns with an acerbity worthy of their English ancestors. The vigour of the competition may have boosted the sale of both brands. And when fourteen years had expired, each patent was renewed, and on the battle raged. Nor was it limited to Connecticut and the surrounding states. Early in the nineteenth century bilious pills were being sold in Georgia to the south and in the newly acquired territory west of the Mississippi River.

The fight against biliousness was not monopolised by the two Lees from Connecticut, nor even within the Lee family. Two other Lees were selling bilious pills. men who were not content, however, to limit their nostrum offerings to a single remedy apiece. By 1800 a Richard Lee & Company was operating a patent-medicine store in Baltimore, both for the city trade and for a regional market. Several years later Richard dropped from sight in Baltimore, and

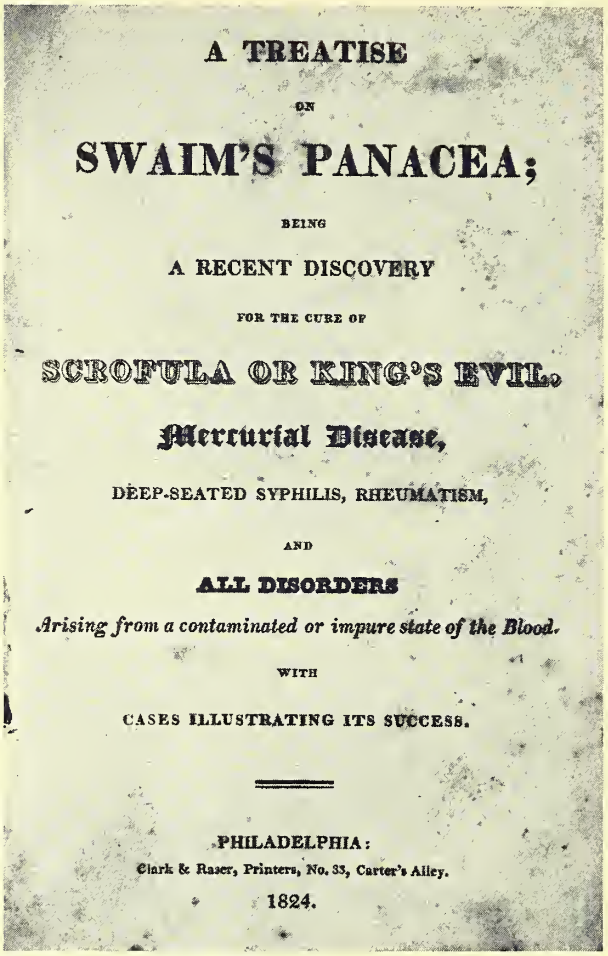
Michael Lee came on the scene. At the same time a Richard Lee appeared in New York City, vending the same brands of medicines the Baltimore Richard had formerly sold. It is tempting to speculate whether he was the same Richard gone on to greener pastures, leaving another member of the family to carry on at the old stand.

If that surmise be correct, Michael in time became Richard's competitor. A Washington paper for 1813 reveals the New York Lee seeking to persuade the sickly in the nation's capital to buy Hamilton's Grand Restorative, his Genuine Essence and Extract of Mustard, his Elixir, his Worm-Destroying Lozenges, whereas the Baltimore Lee bids them purchase Lee's Grand Restorative, his Genuine Essence and Extract of Mustard, his Elixir, and his Lozenges.[15]

Neat Phrasing

Not all American entrants into the promising field of nostrum promotion were Lees. A man named Church, for example, coined a pretty phrase for his Vegetable Lotion "Cream drawn from Violets and Milk from Roses!!"[16] And a man named Dyott surpassed all his rivals during the first generation and became the king of nostrum makers in the American republic.

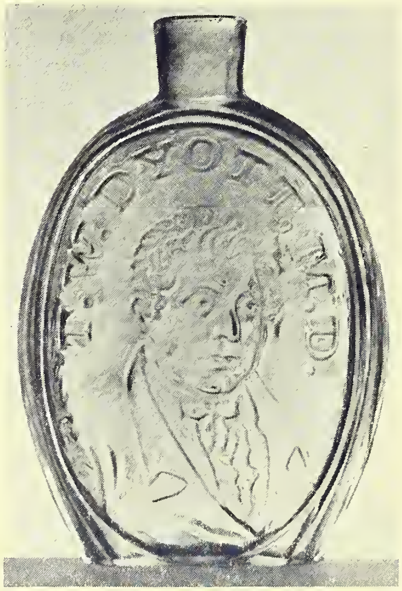
Thomas W. Dyott was proof that the debt of American patent medicines to England had not come to an end with political independence. For Dyott was an Englishman. He had arrived on American shores in the mid-1790's, a poor druggist's apprentice. Settling down in Philadelphia, Dyott began to earn his living at blacking boots. By day he applied the polish which by night he made, and he performed so conspicuously, doing his daubing in the wide window of his small shop, that he attracted attention. Soon he was manufacturing more polish than he himself could apply. The surplus he sold to others. In time he accumulated enough capital to undertake a larger venture. The field of enterprise he chose was patent medicines. At first he opened a store. Early in the new century he acquired a "warehouse." Before long he had moved to an even larger establishment which he called the American Dispensatory.[17]



A TREATISE
ON
SWAIM'S PANACEA;
BEING
A RECENT DISCOVERY
FOR THE CURE OF
SCROFULA OR KING'S EVIL,
Mercurial Disease,
DEEP-SEATED SYPHILIS, RHEUMATISM,
AND
ALL DISORDERS
Arising from a contaminated or impure state of the Blood.
WITH
CASES ILLUSTRATING ITS SUCCESS.

PHILADELPHIA:
Clark & Raser, Printers, No. 33, Carter's Alley.
1824.

Swaim, an ex-bookbinder, promoted his Panacea with many bound pamphlets. This is one of his early title-pages. From the author's collection.



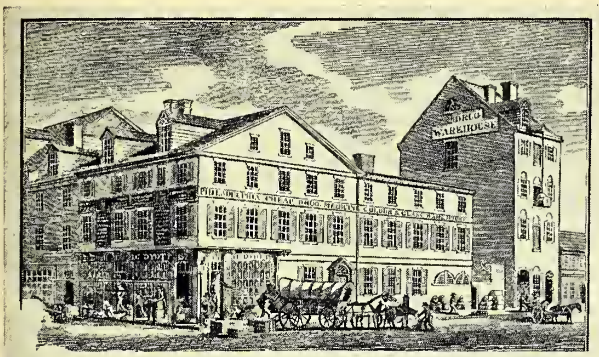
At his Kensington Glass Works, T. W. Dyott had his own face moulded into one side of a flask. On the other side was Benjamin Franklin. The original is preserved in the Smithsonian Institution, Washington, D.C., U.S.A.

Early in his career as a nostrum vendor, Dyott drew on his experience as apprentice pharmacist and began to make his own brands of patent medicines. At first he relied heavily on a compound for the cure of "a certain disease," but soon he was producing a long line of remedies very similar to those of Richard and Michael Lee. Most of those creations bore the name of a Dr. Robertson. That worthy, Dyott asserted in his advertising, was his own grandfather, a distinguished physician in Edinburgh. An enterprising medical journal in Philadelphia, looking into the matter, discovered that there had been no noted Dr. Robertson in Edinburgh for nearly two centuries. The intelligence did not disturb Dyott in the least. He went on vending Robertson's Infallible Worm Destroying Lozenges and the other priceless preparations devised by his honoured progenitor. And he made bold to assert a more lofty dignity himself, assuming the title of Doctor of Medicine and fabricating a tale of long experience as a physician in London, the West Indies and Philadelphia.

Business boomed. Dr. Dyott's advertisements were displayed prominently in daily papers of the Eastern cities and occupied columns of space in the rural weeklies of the hinterland. Better to service his far-flung market, Dyott established agencies in New York, Cincinnati, New Orleans, and other cities. His advertisements featured drawings of large Conestoga wagons being loaded from his capacious warehouses with nostrums for the South and West. Not only medicines of his own manufacture did Dyott sell. He was willing to distribute the old English brands and even pills and potions of rival producers, among them Lee's bilious pills.

A Policy of Expansion

As Thomas Dyott, early in his career, had expanded from blacking to nostrums, so later he enlarged his enterprises again and again. By taking raw products in exchange for packaged remedies, the shrewd merchandiser found that he could make a double profit. Soon he was dealing in cordwood, garden seeds, tobacco, mustard, ham, gin, and coonskin whips. The vastness of his nostrum sales required thousands of bottles, an article he had first required while vending blacking. So Dyott entered that field of endeavour. First he acquired an interest in a glass works, and then full ownership of an extensive factory near Philadelphia on the Delaware River. Dyott not only undercut the prices of imported British glassware, but was soon turning out the best grade of bottle glass in America. Included in his output were flasks that bore moulded portraits of those two distinguished adopted sons



T. W. DYOTT,

Wholesale and Retail Druggist, &c.

Nos. 137 & 139, NORTH-EAST CORNER OF SECOND AND RACE STREETS,

PHILADELPHIA,

Offers for Sale or Barter, at very reduced prices, a large and general assortment of choice and well selected *Drugs and Medicines, Patent Medicines, Chemicals, Dye Stuffs, Colours, Window Glass, Vials, Bottles, &c.* with a variety of other articles usually called for.

His extensive Stock, consisting chiefly of his own manufacture, or of goods purchased at the very lowest prices, for *Cash*, enables him to sell to Country Merchants, Druggists, Physicians, and Manufacturers, on the most advantageous terms, or take in *Barter* any of the following articles, *for which he will always give the highest market prices:* viz. Bright Rosin, Turpentine, Lampblack, Pink Root, Rice, Cotton, Tobacco, Sugar, Molasses, Coffee, Rum, Gin, Brandy, Bees-wax, Wheat Flour, Rye and Buckwheat Meal, Hams, Pork, Bacon, Butter, Lard, Cheese, Rye and Apple Whiskey, Peach Brandy, Mackerel, Shad, Pearl and Pot Ashes, Flaxseed, Flaxseed Oil, Logwood, Firewood, Castor Oil, Castor Oil Beans, Soap, Candles, Glass, Lead, Nails, Glue, Furs, Feathers, Rags, Paper, Bristles, Brushes, Shoes, Hats, Saddlery, Domestic Goods generally, Real Estate, in or near the city of Philadelphia, U. S. Bank Stock, &c. &c. &c.

From the extensive and general assortment of articles offered for sale by T. W. Dyott, and the favourable terms on which he conducts business at his establishment for the accommodation of purchasers, he presumes that country merchants, manufacturers, and dealers in general (whom he solicits to give him a call,) will find it their interest to supply themselves as above.

N. B. Each article is warranted to be of the most pure and genuine quality of its kind.

☞ James Bedford, New-Orleans, General Agent for T. W. Dyott.

Whitely's Philadelphia Annual Advertiser.

Thomas W. Dyott sent West his wagons laden with his nostrums and other wares for sale or barter. The advertisement is reproduced from the Philadelphia Annual Advertiser Directory, 1820.

Courtesy of the Library of Congress.

of Philadelphia: Benjamin Franklin and Thomas Dyott.

By the 1830's Dyott was living extravagantly on a princely income of $25,000 a year. His personal estate was said to be worth a quarter of a million. A man with such expansive vision who had achieved so much was perhaps bound to fancy himself a humanitarian. A pioneer at price-cutting, Dyott had offered to sell his remedies to the "labouring poor at one-half the usual price." And for his own labourers he sought to turn his factory into a sort of model community. Whatever the proportion of alcohol in his remedies, the nostrum king permitted no spirituous liquors in Dyottsville. He himself made that clear in a high-toned pamphlet garnished with classical quotations. Nor was his establishment to be disgraced by swearing, fighting, or gambling. Infractions of his rules brought deductions from pay. The hundred apprentices, who lived on the grounds, were taught reading, 'riting, 'rithmetic, and singing, and made to bathe and attend Sunday School. They worked a ten-hour day.

Factors in Dyott's Success

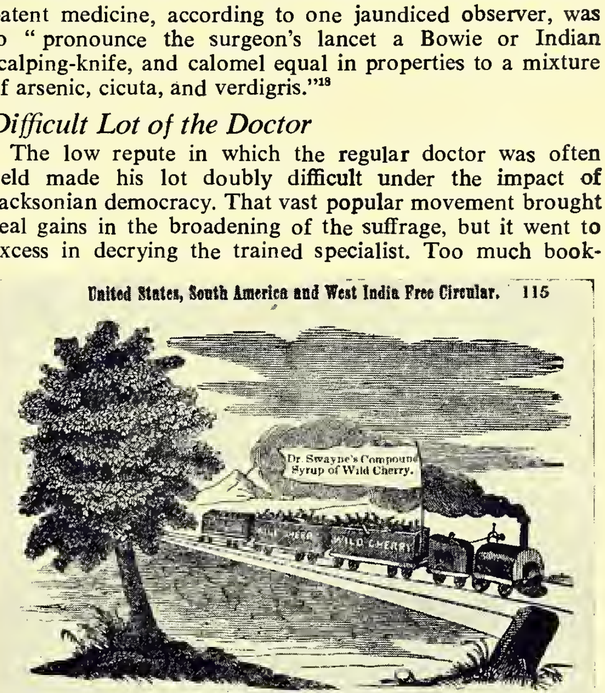
The benevolent baron of Dyottsville owed his success to a number of other factors besides his own business acumen. The means by which a medicine maker could reach his potential purchasers, during the early decades of the nineteenth century, were steadily increasing. Scarcely a hamlet was without its own gazette, and in the cities the new popular penny press was being born. All carried advertising. The postal service was being improved constantly, getting papers into the hands of people who, through the spread of common schooling, were learning how to read. More and more Americans were discovering how to puzzle out the gory symptoms and glorious cures with which Dyott's and other nostrum advertising abounded.

There were medical reasons also for the success of patent medicines. Dyott prospered during the "heroic age" of American medicine when physicians believed in helping along Nature's curative power by strenuous bleeding and purging. Common people, in time, became anxious for an easier road to health than that of yielding pint after pint of blood and losing teeth and even jawbones from too much mercury. Faced with such rigours at the hands of regular doctors, many men and women turned to the new, pleasantly flavoured nostrums, often advertised as containing vegetable ingredients only. Dyott's remedy for "a certain disease" was only one of many patent panaceas widely touted as being non-mercurial. One of the fundamentals for success in a patent medicine, according to one jaundiced observer, was to "pronounce the surgeon's lancet a Bowie or Indian scalping-knife, and calomel equal in properties to a mixture of arsenic, cicuta, and verdigris."[18]

Difficult Lot of the Doctor

The low repute in which the regular doctor was often held made his lot doubly difficult under the impact of Jacksonian democracy. That vast popular movement brought real gains in the broadening of the suffrage, but it went to excess in decrying the trained specialist. Too much book-learning aroused suspicion among the populace. "The priest, the doctor, and the lawyer," one unschooled purveyor of remedies insisted, all were guilty of "deceiving the people." Looking at the tussle from the other side, a regular physician was forced to admit: "The people regard it among their vested interests to buy and swallow such physick as they in their sovereign will and pleasure shall determine; and in this free country, the democracy denounce all restrictions upon quackery as wicked monopolies for the benefit of physicians."[19]

United States, South America and West India Free Circular. 115


Dr. Swayne's Compound Syrup of Wild Cherry.
WILD CHERRY

DR. SWAYNE'S

Compound Syrup of Wild Cherry.

The Great Remedy for

CONSUMPTION.

THE WONDERFUL CURES

performed by this valuable medicine, of Pulmonary Consumption, Coughs, Colds, Influenza, Asthma, Bronchitis, Pain in the side and breast, Sore Throat, Whooping Cough, Spitting Blood, Liver Complaints, &c., have excited the astonishment of all who have witnessed its marvellous effects. There is no account of a medicine, from the earliest ages, furnishing a parallel. The almost miraculous cures effected by this medicine, are unprecedented.

Be cautious to ask for the *original* and only *genuine* preparation, Dr. SWAYNE'S Compound Syrup of Wild Cherry.

Principal Office, corner of Eighth and Race streets,
PHILADELPHIA.

Remember! no preparation of WILD CHERRY is GENUINE, except that bearing the written signature of Dr. SWAYNE. Sold in all the principal towns throughout the United States, by regularly appointed Agents.

Dr. Swayne was one of the many entrepreneurs who shipped packaged remedies from Philadelphia during the second quarter of the nineteenth century. The advertisement is reproduced from the Philadelphia Business Directory, 1846.

Courtesy of the Library of Congress.

State laws establishing licensing requirements for the practice of medicine were swept away. And amidst the babel of voices from adherents of competing medical systems and sects, the nostrum maker could shout to great advantage. He could promise just as much as anybody, explain just as glibly, and cry even more shrilly from newspaper page and billboard. Prospects looked so bright that Dyott got many competitors. It was a simple task, as an Ohio editor pointed out, for "any idle mechanic" to launch a nostrum. He "by chance gets a dispensatory, or some old receipt book, and poring over it, or having it read to him . . . , he finds that mercury is good for the itch, and old ulsers; that opium will give ease; and that a glass of antimony will vomit. Down goes the hammer, or saw, razor, awl, or shuttle—and away to make electuaries, tinctures, elixirs, pills, plasters and poultices."[20]

Purgatives were perhaps best of all. For the dietary dark ages still prevailed. The belief was widespread that all foods contained one "universal element" which kept life going, so quantity and not quality was stressed. Nothing so scandalised the visitor from Europe as American eating habits. Overeating was bad enough, but that evil was compounded by a diet emphasising starchy dishes, salt-cured meats, and fat-fried foods, and lacking in fresh fruits and vegetables. The American motto, said one European traveller, was "gobble, gulp, and go."[21]

Purges of various potencies were a popular prescription by regular physicians. The quacks, too, as a New York doctor pointed out, fastened on the "almost universal prevalence of indigestion." But no one who read the advertisements had to be told. Bilious pills abounded, and there were scores of other remedies on the market "whose chief mission," as a pharmacist put it, "appear[ed] to be to open men's purses by opening their bowels."[22]

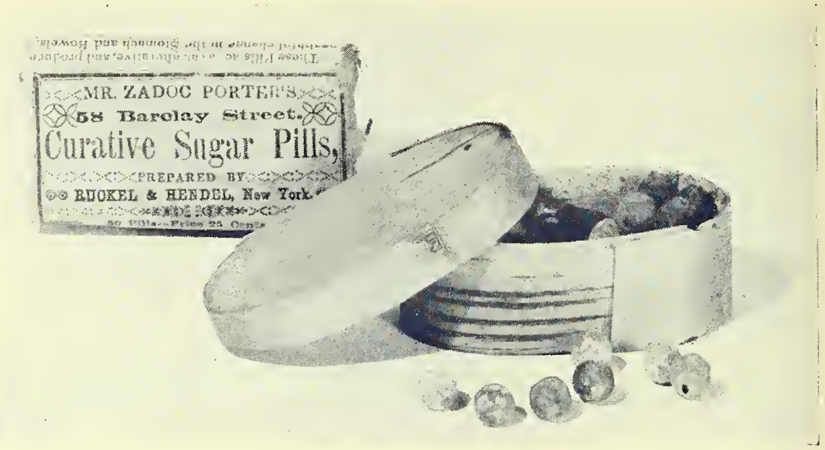
Despite the booming nostrum market, the benevolent baron of Dyottsville ran into trouble. Once again branching out, he established a bank promising "to give to the meritorious working man the full legal interest which he ought always to obtain for his savings." In 1837 financial panic struck the nation. Dyott parcelled out his stock among relatives and took refuge in bankruptcy.

Dyott's creditors were suspicious. They persuaded Pennsylvania officials to sue the nostrum maker for fraudulent insolvency. His conduct, a prosecuting attorney told a jury, could be summed up as "systematic wholesale cheating." The jury seemed to agree. He was sentenced to a term in jail.

Such a severe blow from fortune may well have made the former bootblack wish that he had limited his sphere of business activity to the manufacturing and sale of patent medicines. That at least was safely within the law. And it was to that more circumscribed career of nostrum vendor that Dyott returned after his release from prison. He had time to acquire another modest fortune before his death.

Thomas Dyott died in 1861, in his ninetieth year. At his death the old English patent medicines were still alive, but their rôle was not the same as it had been in colonial America. No longer proprietary items, they were every druggist's property. He could buy bottles of the familiar ancient shapes filled by a wholesaler, or he could buy empty bottles and fill them himself from published formulas. In such circumstances the old English medicines were scarcely advertised at all in the public Press. They had passed on the brazen sauciness of their youthful appeals to their hundreds of American heirs. And American promoters had learned their lesson well. Not every idle mechanic who dropped his hammer to take up pill-making reached the thousands of gullets that Thomas Dyott did. But, one and all, they poured forth a vast flood of remedies.

"Quackery," insisted one physician in the year that Dyott died, "kills a larger number, annually, of the citizens of the United States than all the diseases it is pretended to cure.



Porter's Curative Sugar Pills, manufactured in New York City, were one of the first sugar-coated pills made in America. The original is preserved in the Smithsonian Institution.

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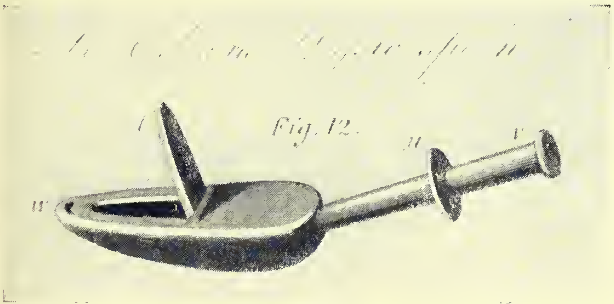
Mr. Gibson's Physic Spoon

By AGNES LOTHIAN

THE physic or medical spoon made its first public appearance in 1828, when Mr. Gibson, of 71 Bishopsgate Street Within, demonstrated his invention at a meeting of the Society instituted at London for the Encouragement of Arts, Manufactures, and Commerce. He was awarded the Society's silver Isis medal for his invention. In the London directories of the period Charles Gibson is described as a goldsmith.

The cut of the physic or medical spoon for administering nauseous medicines was drawn by Cornelius Varley[1] and engraved by W. Kelsall. It is illustrated in No. 1, taken from Vol. 46 of the Society's *Transactions* published in 1828. The description of Mr. Gibson's invention is as follows:—

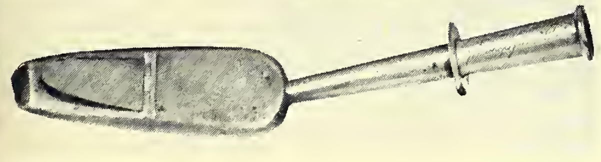


1. Engraving of physic or medical spoon from the *Transactions* (1828) of the Society for the Encouragement of Arts, Manufactures and Commerce (Royal Society of Arts).

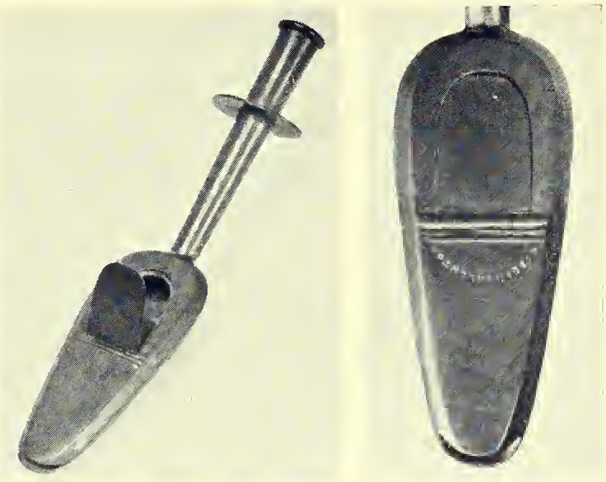
> "In administering medicine in an open spoon to fractious children or to insane persons, part of it is often lost from the struggles of the patient. To remedy this inconvenience, and thus to bring the quantity of medicine given to greater certainty, Mr. Gibson has invented a covered spoon, represented in Fig. 12, Plate I.
>
> The bowl of the spoon is covered, except just at the extremity *w*, where there is an orifice for the discharge of the fluid; in the cover is a flap *t*, with a hinge, which is opened in order to pour in the medicine; the handle *v* is round and perforated, opening externally, and also into the bowl. In order to use it, the medicine is to be poured into the bowl, and the spoon is so to be held in the hand that the thumb may cover the hole at the end of the handle, and two of the fingers may press against the disk *u*, so as to have a firmer hold; the spoon is then to be thrust sufficiently far into the patient's mouth, the thumb is to be withdrawn, and the pressure of the air will immediately force the medicine out of the spoon into the patient's throat."

The earliest Gibson spoon recorded is in the Wellcome Historical Medical Museum, London. It is made of silver and bears the silver mark of 1827 on the inside of the bowl. Gibson's signature and address are inscribed on the stem (illus. 2). This documentary piece is similar to another spoon (unsigned) with the 1829 silver mark. Both spoons measure $5\frac{1}{2}$ in. in length and resemble the spoon in Varley's drawing.

A number of pewter spoons exist marked GIBSON INVENTOR. It is noteworthy, however, that the pewter example illustrated (3 and 4) opens towards the handle and not towards the spout as in the original (photograph by courtesy of Mr. J. Stanton, London).



2. Silver medicine spoon signed "C. Gibson, Inventor, 71, Bishopsgate St. Within." Silver mark inside bowl for 1827. (Copyright, Wellcome Historical Medical Museum, London).

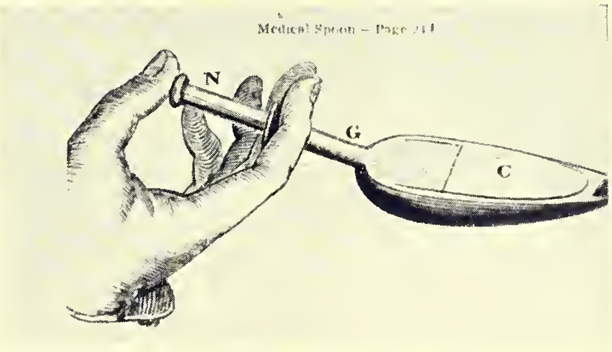


3 and 4. "Gibson" spoon in pewter, opening towards handle.

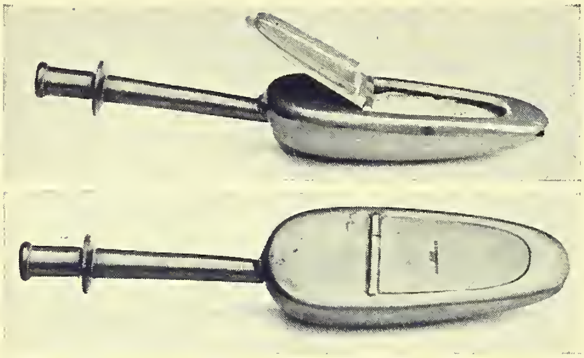
By the 1830's "improved medical spoons" were listed in three sizes in Maw's catalogue; they were priced at 1/4, 1/8 and 2/3 respectively. The method by which the spoon was to be used is clearly demonstrated in illustration 5. The cut is reproduced from the "Catalogue of Surgical Instruments" issued by J. & S. Maw, London, in 1832[2]. One of these early pewter spoons marked J. & S. Maw (not illustrated) is in the Wellcome Historical Medical Museum; it is 6·3 in. in length.

Solomon Maw used the same illustration in his 1839 catalogue[3] published at his "manufactory at No. 11 Aldersgate Street." The firm was restyled J. & S. Maw when the founder George Maw retired in 1828 and left the business to be carried on by his sons, J. H. Maw and Solomon Maw. Maw's business was removed to Aldersgate Street in 1834, J. H. Maw retiring shortly afterwards. George Maw was described as a "pewterer," the style of surgical instrument makers of that time, when pewter was universally employed for syringes, bleeding bowls, etc. The spoons marked "Maw Aldersgate St." must therefore be of later date than the "J. & S. Maw" spoons. Pewter or Britannia metal medical spoons appear again in the 1869 and 1882 lists—the latter issued by S. Maw, Son & Thompson, the designation of the firm between 1870 and 1901. The fluid capacity of these spoons varies from $\frac{1}{2}$ oz. to 1 oz.

John Savory, of 143 Bond Street (the founder of Savory & Moore), in his *Companion to the Medicine Chest* pub-



5. Catalogue illustration showing method of use of spoon.



6a and b. Pewter spoon marked "Maw, Aldersgate St" shown open (above) and closed.

lished in 1836, also illustrated the medical spoon, together with the following observations:—

> "For administering medicine to children and adults, without their tasting, or being able to resist its passing into the stomach; and for giving medicine and food in a recumbent position. This spoon is made to contain the quantity required, which is put in at the cover C, and then shut down tight; the tube G is then placed between the fingers, and the thumb pressed on the end of the tube N. When in the mouth, the thumb is removed."

There are also medical spoons in Britannia metal marked "James Dixon & Sons." Those were made by James Dixon & Sons, Sheffield, who were at that time manufacturers of Britannia metal wares. Their spoons have the opening towards the spout and are very similar in appearance to those supplied by Maw's. A James Dixon & Sons spoon from the collection of Mr. Charles Rowed is illustrated in the *C. & D.*, January 31, 1914, p. 146 and also in the *C. & D.* Annual Special Issue, June 25, 1927, p. 822. James Dixon & Sons, Ltd., manufacturing silversmiths, Sheffield, 6, inform me that their medicine spoon was introduced in 1839. It was illustrated in their catalogue of that period, where the sizes available were stated as "small, middle and large."

These physic, or castor-oil spoons, as they are sometimes called, are now of more interest to those who collect pharmaceutical or domestic bygones, but it does seem clear from the inventor's description that the nauseous draught was *not blown down the throat* of the unfortunate patient as has been suggested by many writers.

[1] Cornelius Varley (1781–1873), an artist and inventor, was the father of C. F. Varley, one of the pioneers of telegraphy.

[2] A priced Catalogue of Surgical Instruments, pharmaceutical implements, dispensary utensils, labels, etc., manufactured and sold by J. S. Maw at 55 & 54 Aldermanbury, London, 1832.

[3] A Catalogue of Surgical instruments, pharmaceutical implements, dispensary utensils and vessels, etc., manufactured and sold by S. Maw at his Manufactory at No. 11 Aldersgate Street, London, Nov. 1839.

Permission to reproduce photographs gratefully acknowledged to the Director of the Wellcome Historical Medical Museum; to Mr. John Stanton, London; and to S. Maw, Son & Sons, Ltd., Aldersgate House, New Barnet, Herts.

Leaf Surface

Its part in resisting or admitting chemicals

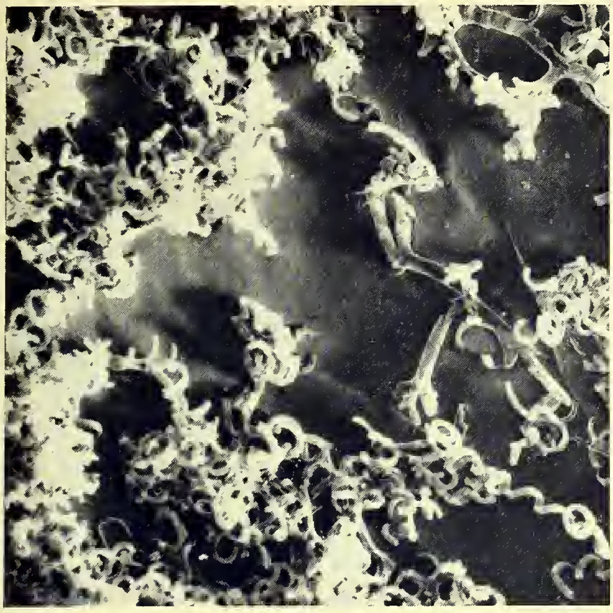
STEPHEN B. CHALLEN, B.Pharm., B.Sc., Ph.D., F.P.S., F.L.S.

RECENT studies indicate the fundamental importance of the macroscopic, microscopic and submicroscopic morphology of the surfaces of leaves in the distribution, retention and penetration of chemicals applied to them. Those factors influence the techniques of formulation. Leaf surfaces have also been shown to play a significant rôle in the defence mechanisms of plants against pests and diseases.

Surface Characteristics

Leaves of higher plants differ macroscopically in the prominence and distribution of veins, and in the presence or absence of hairs or trichomes. The surface of a leaf is protected by a layer of cuticle which covers the epidermis closely and follows the contours of all epidermal cells, including those overlying veins and the epidermal outgrowths or trichomes. The cuticle is frequently smooth—always so in young leaves—but on mature leaves it may be roughened by nodules, cracks, ridges or striations.[1] The cuticle of *Atropa belladonna* exhibits striations which follow the wavy anticlinal walls of the epidermis. Cuticle varies in thickness with the degree of exposure of plants to a drying climate, and is therefore responsible for water conservation. The cuticle layer is important as a barrier to the penetration of parasitic fungi and the sucking organs of insects, and the immunity of certain cultivated varieties of plants to pests and diseases may therefore sometimes be traced to the thickness of the cuticle. A waxy layer is often associated with the cuticle, and the leaves of plants may be classified as waxy or non-waxy. The leaves of potato and tomato are non-waxy while those of the indian-rubber plant and the leek are waxy. The occurrence of wax is responsible for the greyish "bloom" which is frequently described by the term "glaucous." The waxy covering may be seen as minute grains which are loosely adherent to the cuticle, as slender rods attached to the surface by their ends, or forming a more or less continuous sheet. The smooth waxy cuticle of *Juncus inflexus* is folded into ridges and that of *Salvinia* sp. shows curious microprojections. Wax is found as sheets 5-mm. thick on the leaves of the palm *Ceroxylon andicolum* and in such quantity that it can be scraped off for use in making candles. The leaves of the wax palm *Copernicia cerifera* of Brazil produces large amounts of wax, which is collected and marketed as Carnauba wax.

De Bary (1871), who discovered and illustrated the waxy layer of leaves, mentions granular, columnar and plate-like structures. The idea that the leaf wax arises from wax canals is now disproved, and although the mechanism of wax production is imperfectly known it appears that wax is extruded as a soft paste via the cuticle. The cuticle in cross section is complex, being constructed of external cutin (polymerised acids) and wax (higher alcohols and other constituents), then a cutin framework with wax platelets embedded in it.[2] By means of electron microscopy several workers have investigated the submicroscopic morphology of leaf surfaces, for in the majority of plants the surface roughness is beyond the limits of resolution of the ordinary microscope.[3], [4]. Surface replicas reveal minute projections which are assumed to be wax extrusions. Different forms have been found that may be characteristic of species, genus or even family, but, in view of the immense range of surface morphology exhibited, a classification is at present impossible. *Musa* sp. show ribbon-like forms and these are associated with large pits in the leaf. All forms of *Brassica oleracea* look much alike (chimney-like structures), while those of *Chrysanthemum segetum* resemble macaroni. Other plants show "crys-

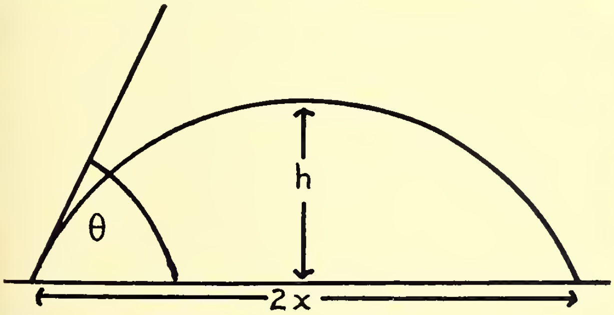


An electron micrograph of the leaf surface of ***Chrysanthemum segetum.***

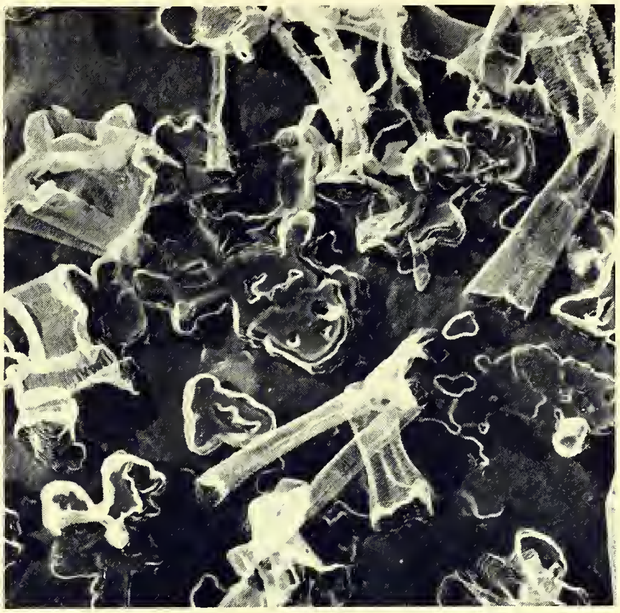
talline " granules and nets composed of fine threads. The degree of wax formation varies in leaves, according to species, between upper and lower surfaces, and according to age and environment. Wax may be brushed off but fresh wax can form in a matter of a few days, and a similar process takes place following damage to the waxy covering by weathering. The waxy layer of the leaves of different plants has been fractionated into wax, acidic, volatile and oily components and the relative amounts of the main fractions have been found to differ widely. Wax predominates in the waxy covering of the leaves of cabbage and cauliflower, and acidic materials predominate in the waxy covering of apple and pear leaves.[5]

Water Repellency of Leaves

In view of the variable cutin-wax complex of leaf surfaces, water repellancy and wettability are subject to comparable variation. Fundamental studies have been carried out on the wetting by water of leaves of different age and different species, and of others grown under different conditions.[6] Such determinations are made using advancing contact angle as a measure of the extent to which wetting takes place. The magnitude of the contact angle θ for water, on a leaf surface is ascertained from measurements of a drop of 3-mm. diameter. Using Mack's formula, $\theta = 2 \tan^{-1} (h/x)$, contact angles of less than 90° can be calculated. For contact angles greater than 90° a less straightforward procedure is required. The highest contact angle for a plane surface of natural occurrence is probably not above 105° (for water on paraffin wax),[7] but many plants have apparent contact angles in excess of that figure. The magnitude of the contact angle for a liquid on a solid surface is governed by the nature of the chemical groups at the surface, the degree of surface roughness, and the presence or absence of an air film below the drop of liquid. True contact angles below 90° are decreased by increasing the roughness of the surface, while true contact angles above 90° are increased by decreasing the roughness of the surface. If an air film is present below the drop, then the observed contact angle becomes more than the true figure. A few of the high values that have been recorded are due to variations in the macroscopic and microscopic morphology of leaf surfaces, but in the majority of species studied high contact angles are due to roughness that is submicroscopic. The leaves of peas, flax, fat-hen and knotgrass are not easily wetted by water, yet water easily spreads in a continuous film over the leaves of beans, charlock and buttercup. The contact angle for



Water droplet, illustrated diagrammatically, on leaf surface. θ = contact angle; h = maximum depth; 2x = diameter.



An electron micrograph of the leaf surface of ***Brassica oleracea,*** **var.** ***capitata.***

Cellulose acetate replica of the upper epidermis of ***Atropa belladonna.*** **The two micrographs are at ten times the magnification of the cellulose acetate replica.**

water on the leaf of wild mustard is 96° while the value for wheat is 140°, hence those leaves differ markedly in their wettability. When the waxy layer is removed from the leaf of wild mustard the contact angle falls from 96° to 29°.

Formulation of Foliar Sprays

The wettability of leaves greatly influences the distribution, retention and penetration of chemical deposits on treated crops, hence liquid preparations should be formulated to ensure adequate wetting of the species undergoing treatment. For leaves which are hard to wet (e.g., onion), spray droplets form into large drops and then roll off like water from an oily windshield, producing "run off." A wetting agent is necessary to prevent that. For leaves which are easily wetted (e.g., potato), the spray droplets tend to drain off on to the ground, illustrating the necessity for a sticking agent. In consequence of research work on the mechanism of spray retention on leaf surfaces and factors controlling "run off," it is now possible to lay down principles that can guide the formulator as to whether or not a wetting agent is desirable.[8] The advantages and disadvantages of adding a wetting agent to MCPA formulations have been considered in some detail.[9] The successs of the older herbicides copper sulphate and sulphuric acid largely depends upon differences in retention between crop and weed. That also applies to the newer herbicide Dinoseb and partly affects its specificity. Wettability differences are exploited for the removal of wild mustard from wheat fields by spraying with aqueous solutions of DNOC. The application of TCA to the soil in which peas are growing brings about a change in the nature of the leaf surface such that the use of Dinoseb is no longer safe.[10]

Leaf surfaces have so far been considered in connection with the retention of chemicals and related formulation problems. Another aspect that influences formulation technique is actual cuticle penetration. The waxy unbroken cuticle of the upper epidermis of apricot leaf is particularly thick, and different oils fail to penetrate its surface. There are a variety of pathways by which chemicals may penetrate leaf surfaces. Such routes are the modified epidermal cells overlying veins, stomatal apertures, cracks in the cuticle, and stretched cuticle. The rapid herbicidal action of herbicidal oils of low viscosity is brought about by stomatal penetration. The penetration of leaf cuticle by DNOC and the derivatives of phenoxy-acetic acid is affected by *p*H. Sorption is low at *p*H 8 and high at *p*H 4, therefore buffering on the acid side increases toxicity. Whereas sorption of *2, 4—D* at *p*H 9 does not normally occur, the addition of a cationic detergent (e.g., amine 220) allows penetration. It is likely that the leaf cuticle influences the problem of phytotoxicity through the fixation of chemical residues. Many insecticides now in use are fat-soluble, and are therefore likely, after deposition on the leaf surface to pass into the surface waxy layers. Deeper penetration may follow, and consequently the insecticide would be no longer available as a surface contact poison. It is known that gamma BHC passes readily into leaf cuticle and that DDT does so to a limited extent. That limitation, however, might not be so serious as at first sight, as insecticide which is retained in the cuticle would be more resistant to weathering than crystals deposited on the waxy surface. It has been shown that the oily solvent chosen for a DDT emulsion or miscible-oil formulation influences the penetration of the chemical into the waxy layer. Whereas an aqueous suspension of DDT forms a crystalline deposit on the leaves of apple, no crystalline deposit remains after the use of an emulsion formulation.

One other property of the leaf surface is in connection with the fungitoxic action of bordeaux and burgundy mixtures. The prolonged toxicity of those fungicides is probably due to the copper-solubilising effects of the water-soluble acids which are found in the surface waxy deposits of apple, laurel and other leaves.[11]

Leaf Distribution of Chemicals

In order to assess the spray coverage of different formulations and the type of deposit on the surfaces of leaves, as well as the efficiency of application machinery, ingenious microscopical methods have been devised. Surface impressions may be recorded on a gelatin film, which is prepared on a glass slide and viewed under the microscope.[12] Alternatively an impression is made on a strip of cellulose acetate, using a solution of cellulose acetate 5 per cent. w/v in acetone as adhesive.[13] Both methods produce a transparent negative of the leaf contours, showing epidermal and cuticular characteristics in addition to the distribution of spray deposits. The cellulose-acetate method is better for hard rigid surfaces where greater pressure is possible and is used for studying water soluble residues. The chief disadvantage of the gelatin technique is that not all deposits may be removed, and that impressions are left instead, but the method should be used when residues are soluble in acetone. Spray deposits of copper and sulphur preparations are neither crystalline nor strongly coloured. For that reason a solution of sodium diethyl-dithio-carbamate is used to produce black areas of a copper complex, and lead acetate is used to produce a black deposit of lead sulphide.[14] Using that method the distribution of copper from a single spray droplet of bordeaux mixture has been demonstrated, the particles having collected in cuticular depressions at the edges of epidermal cells.

Leaf Surfaces as a Natural Defence

Several investigations are now in progress regarding the chemical constituents of plants which play a part in the natural resistance against fungal diseases. It has been discovered that some of the fractions which are obtained from the leaf waxes of apple (varieties Worcester and Cox) when sprayed on mildew susceptible leaves bring about a reduction in the germination of apple-mildew conidia. The most striking fungistatic effect is shown by the ether-soluble acidic material, which can be extracted from apple-leaf waxes. Those substances are phenolic and non-phenolic, and the acids comprise 50 per cent. of the waxy covering.

Leaf-surface defence mechanisms are not confined to protection against fungi. Hairy varieties of legumes and cotton have been reported to carry fewer leaf-hoppers than non-hairy varieties, and the relationship has sometimes been considered to be a mechanical one. It is possible that in some circumstances differences in the intensity of light reflected from hairy as compared with glabrous leaves may account for differences in the numbers of leaf-hoppers attracted to the respective varieties.[15] Therefore that example is not merely one of resistance on the part of the host plant but involves preference and non-preference on the part of the insect, and is determined by the macroscopic characters of the leaf surface.

The following abbreviations have been used:—Dinoseb: dinitro-secondary butyl phenol; MCPA: 2-methyl-4-chloro phenoxyacetic acid; DNOC: dinitro-orthocresol; TCA: trichloracetic acid; 2, 4-D: 2, 4-dichlorophenoxyacetic acid; amine 220: 1-hydroxyethyl-2-heptadecenyl glyoxalidine.

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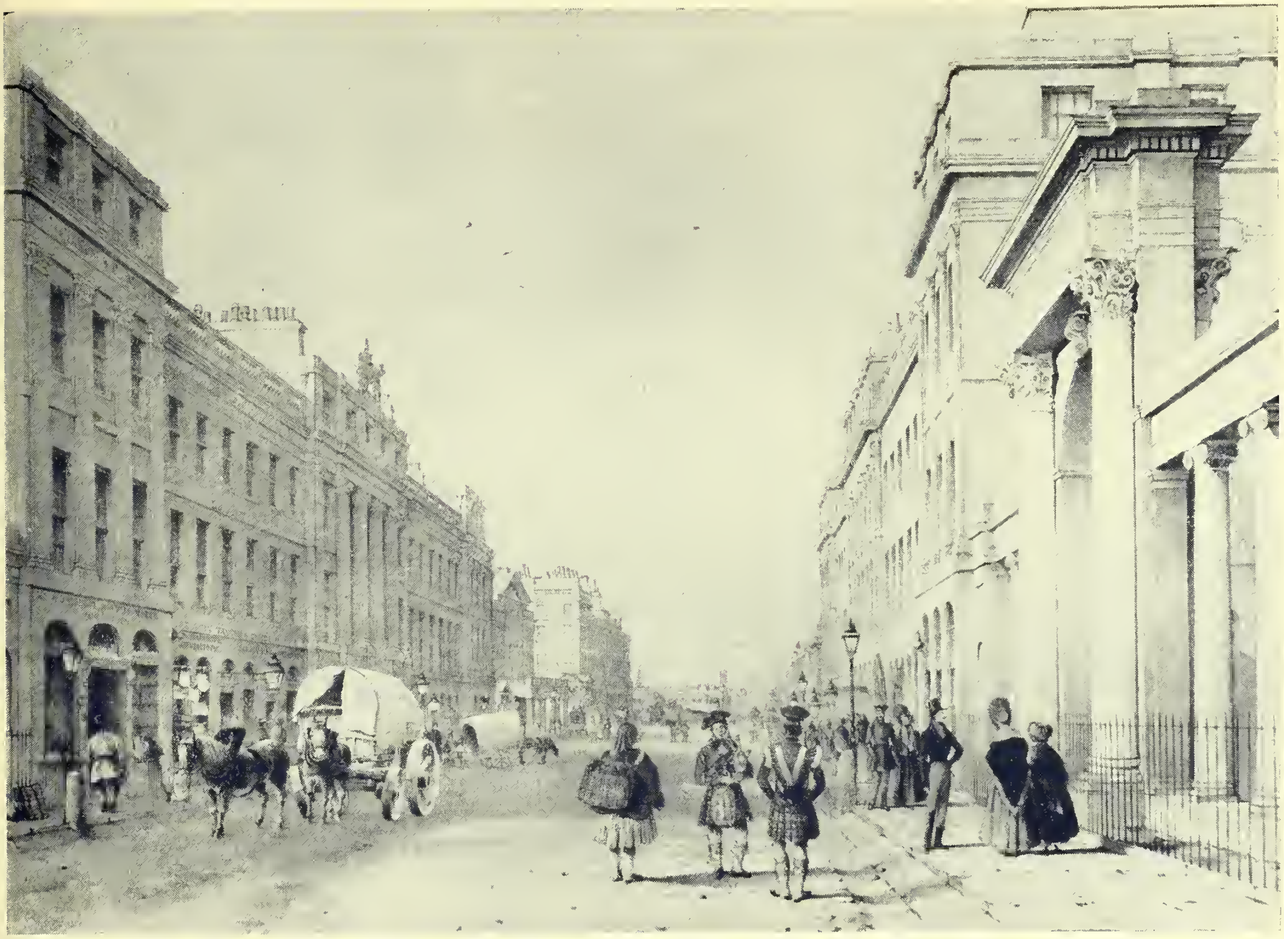


Waterloo Place, Edinburgh, in the early nineteenth Century. Butler's original shop is seen on right with the sign of the carboy, immediately beyond ornamental bridge.

Baildon's of Edinburgh

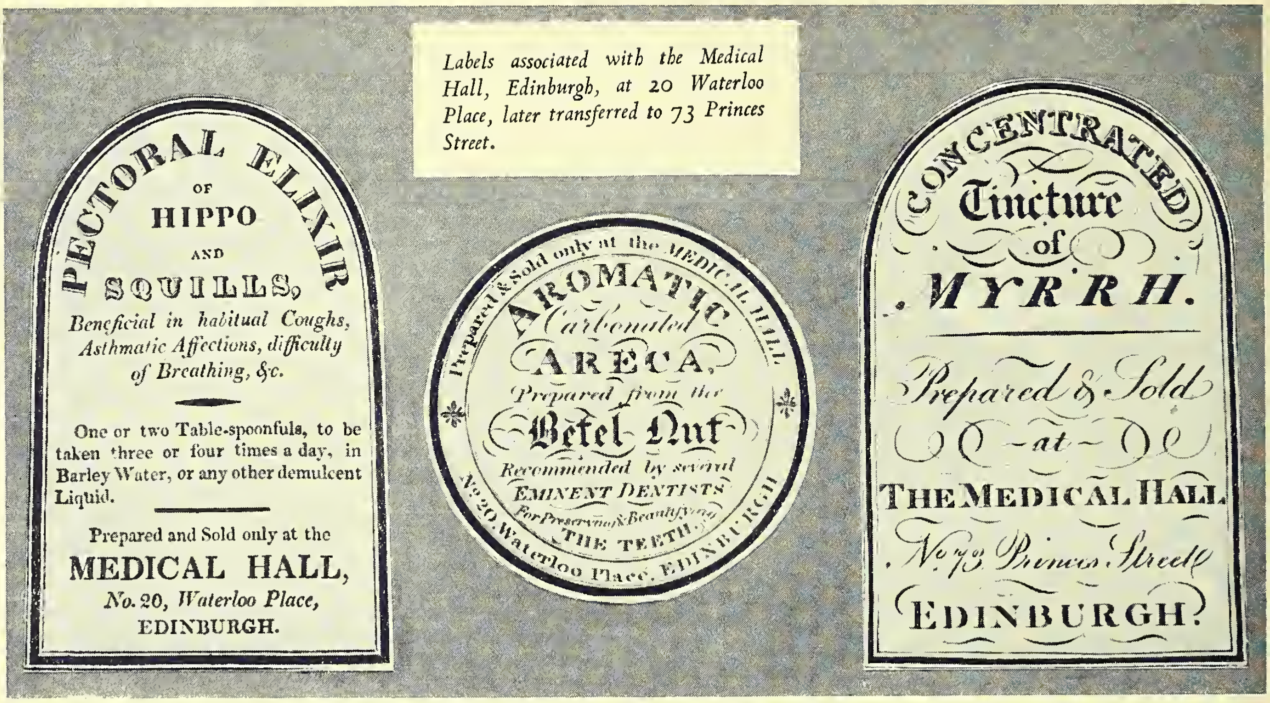
1821-1958

C. G. DRUMMOND

SCOTLAND, in the year 1820, was the scene of much poverty and unemployment in the aftermath of the Napoleonic wars. In Edinburgh, in an effort to relieve the distress, a road—known as the "Radical" road—was constructed on Salisbury Crags in Holyrood Park. In the circumstances, it might have been thought that the time was unfavourable for the launching of a new business venture, but other factors, such as the growth of the New Town, may have influenced the decision of a London firm of chemists and druggists to consider Scotland's capital as a likely city for an extension of their activities. Butler & Co., the firm in question, commenced business in Cheapside, at the corner of St. Pauls, London, in 1805, a year better remembered for another event of a still wider historical interest.

Richard Butler, founder of the firm, was later joined by his sons Thomas and Charles, who, under the title of T. & C. Butler, opened a second pharmacy in Lower Sackville Street, Dublin. By 1821 the way seemed open for the ambitious project of providing a first-class pharmaceutical service in three capital cities, and that ambition was realised with the acquisition of premises at 20 Waterloo Place, Edinburgh. The choice of site was, no doubt, determined by the fact that, as recently as 1817, a new thoroughfare had been constructed, opening a splendid gateway to the east from Princes Street. New terraces of handsome houses were making their appearance in every direction, and it was clearly the intention of Butler & Co. to recruit their business from that section of the populace least affected by the depression consequent upon the war.

On December 11, 1821, the curtain was rung up on a long run which terminated, alas, in 1958. (It is difficult to avoid the theatrical metaphor, for the premises were less



PECTORAL ELIXIR
OF
HIPPO
AND
SQUILLS,
Beneficial in habitual Coughs, Asthmatic Affections, difficulty of Breathing, &c.
One or two Table-spoonfuls, to be taken three or four times a day, in Barley Water, or any other demulcent Liquid.
Prepared and Sold only at the
MEDICAL HALL,
No. 20, *Waterloo Place,*
EDINBURGH.

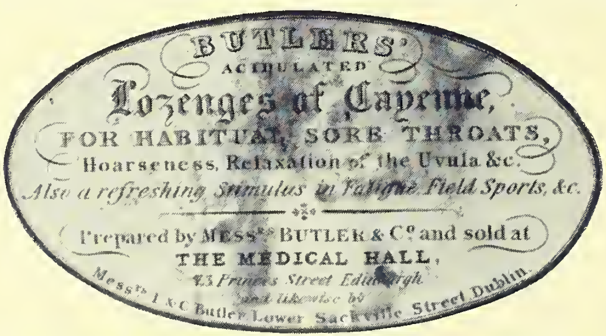
Prepared & Sold only at the MEDICAL HALL
AROMATIC
Carbonated
ARECA,
Prepared from the
Betel Nut
Recommended by several
EMINENT DENTISTS
For Preserving & Beautifying
THE TEETH.
No. 20, Waterloo Place, EDINBURGH

CONCENTRATED
Tincture
of
MYRRH.
Prepared & Sold
at
THE MEDICAL HALL,
No. 73 Princes Street
EDINBURGH.

Labels associated with the Medical Hall, Edinburgh, at 20 Waterloo Place, later transferred to 73 Princes Street.

than 100 yards from the old Theatre Royal, Shakespeare Square.) Fortunately the original prescription books have been preserved, and they reveal that, on that historic day in December, one prescription was dispensed. It is in the name of James Drummond, Esq., and calls for a lotion compounded of Acetis Plumbi; Acet. Distillat. and Aq. fontana. Two days passed before another entry appeared, but marginal notes indicate that the new venture had reason for hope—both items are marked " paid."

Early evidence of confidence in the firm is given by an entry, dated December 22, 1821, in the name of Dr. Duncan, sen. Andrew Duncan (1744-1828), who was Professor (physiology) of the Institutes of Medicine, was then coming near to the close of a remarkable career. He had many interests, medical, scientific and convivial, and one of his projects in Edinburgh came to have a particular interest for pharmacists the world over. The founding of the Royal Infirmary in 1726, and its subsequent rapid growth, brought much-needed succour to the sick poor, but it left gaps in that it was able to cope only with those who were regarded as curable. Andrew Duncan, by his efforts and influence, conceived a plan for out-patient treatment of all kinds of illness, and in 1726 there was opened, in West Richmond Street, the Royal Public Dispensary. Pharmacy was taught there from the beginning, and many pharmacists will remember to this day a namesake of the founder: William Duncan, Ph.C., F.C.S., who became principal of the School of Pharmacy in the 1880's and continued to teach until his retiral in 1925. " Duncan's " is now merged in the pharmacy department of the Heriot-Watt College.



BUTLERS'
ACIDULATED
Lozenges of Cayenne,
FOR HABITUAL SORE THROATS,
Hoarseness, Relaxation of the Uvula &c.
Also a refreshing Stimulus in Fatigue, Field Sports, &c.
Prepared by Messrs BUTLER & Co and sold at
THE MEDICAL HALL,
73 Princes Street Edinburgh
and likewise by
Messrs I & C Butler Lower Sackville Street Dublin.

Label showing the association of Butler and Co., the Medical Hall, Edinburgh, with I. & C. Butler, Lower Sackville Street, Dublin.

The prescription for Dr. Duncan, sen., reads:—

℞ Tr. Cinchona
Tr. Calumba aa℥ii
Tr. Cinnamomi ℥i m.
Sig. The Stomachic Tincture.

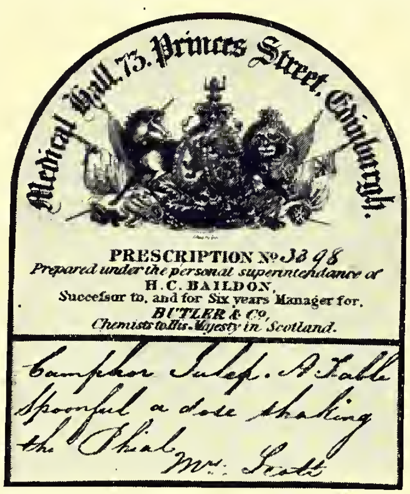
The business gathered strength, and it is ironic to find recipes for preparations which achieved all-but immortality. One would naturally expect to find the famous powder of Dr. James Gregory, in practically the form in which it was ingloriously rejected by the British Pharmacopœia Commission in 1958. Then there is a mixture of magnesia and sugar of aniseed, known as Dr. Thatcher's Carminative. Forty years ago, in the writer's early days in pharmacy, the grandson of Dr. Thatcher, faultlessly attired in top-hat and frock-coat, was a " kenspeckle " figure in Edinburgh's West End. His progenitor's carminative was still in use after a century of service in the disinflation of babies.

Thomas Butler resided first above the shop, and later in St. James' Square, and business expanding sufficiently to warrant the addition of a partner, the firm became Butler & Stone in 1826. Development of the city, and the increasing popularity of Princes Street, led to a move to No. 73 in that famous thoroughfare. It appears from the records that, while the principal business removed to Princes Street, the original premises at Waterloo Place continued to operate as a pharmacy. But continuity through Waterloo Place to Princes Street is clearly shown by the fact that the prescription books were transferred from the old to the new premises, and run continuously over the years from 1821 onwards.

It also appears to be the case that a young Englishman, H. C. Baildon, was engaged to manage the Princes Street pharmacy from its opening. Stone dropped out, and the labels of the period describe the pharmacy variously as Butler & Co. and " The Medical Hall." Baildon brought to Edinburgh the experience and authority conferred by a sojourn in the employment of John Bell, of London. The business continued to expand under his care, and the prescription records bear evidence of the confidence reposed in young Baildon by a considerable and aristocratic *clientèle*.

Meanwhile the Butlers, in common with other pharmacists of high standing and attainment (such as Allen & Hanburys; Duncan, Flockhart; J. F. Macfarlan and T. & H. Smith) began to interest themselves in wholesale activities, though not, it seems, in manufacturing, and in 1833 Baildon acquired the pharmacy at 73 Princes Street. The name Butler continued to be associated with Waterloo Place for a few more years, then finally disappeared from the Edinburgh scene.

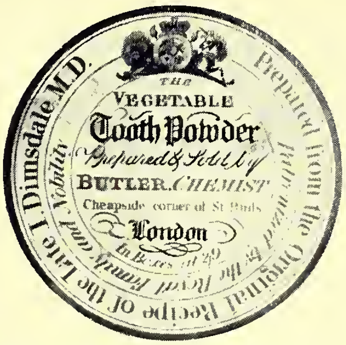
As has been said, Princes Street catered for a select section of Edinburgh society, and, though a complete list of the aristocratic names in the early prescription books is unnecessary, mention of a few will serve to indicate the type of business it had by that time become:—The Countess of Hopetoun, Earl of Rosslyn, Earl of Caithness, Earl of Mar, Lady Shelley, Lady Trowbridge, Lady Douglas, Lady Dunbar, Lady Trotter, Lady Ann Maxwell, Her Grace the Duchess of Buckingham and Lady Haddington. It is extremely likely that some of those people patronised the Butler & Co. pharmacy in London, and were attracted by the name, but history suggests that Baildon himself was no mean factor in the rapid growth of the business. Lady Haddington, last-named in the above list, was the Countess of the Hereditary Keeper of Holyrood Park. (Hereditary "giver-away" might have been a more appropriate title, for Grant, in *Old and New Edinburgh,* states that the Earl permitted quarrying on Salisbury Crags, to the benefit of London's streets and, it is alleged, the keeper himself, if to the detriment of the crags. Legal steps were taken to stop the practice.)



Medical Hall. 73. Princes Street, Edinburgh.

PRESCRIPTION No 3398
Prepared under the personal superintendance of
H. C. BAILDON,
Succeſsor to, and for Six years Manager for,
BUTLER & Co,
Chemists to His Majesty in Scotland.

Camphor Julep. A Table
Spoonful a dose shaking
the Phial.
Mrs. Scott



Prepared from the Original Recipe of the Late T. Dimsdale M.D.
Patronized by the Royal Family and Nobility
THE
VEGETABLE
Tooth Powder
Prepared & Sold by
BUTLER. CHEMIST
Cheapside corner of St Pauls
London
In Boxes at 2/-

Above: Label for dispensed medicines.
Below: Label for a "Vegetable tooth powder" sold by the London pharmacy of which the business of Baildon's was originally established as a branch.

The name of Sir John Pringle of Stichell, Bart., appears in four consecutive prescriptions, the author of which was none other than H. C. Baildon himself. Such faith in the competence of the druggist is a compliment indeed from a descendant of that Sir John Pringle who was Physician-General to the Duke of Cumberland; who was the originator of the Geneva Convention; who gave the word "antiseptic" to medicine, and who—most famous of all military physicians—is buried in Westminster Abbey.

In a city with a garrison at the Castle and a large cavalry barracks at Piershill, it is natural to find a number of military titles. But not all are those of serving officers, for Edinburgh has always had an attraction for retired warriors. One of those was General Sir David Baird, whose adventurous career in India earned for him the name of "Baird of Seringapatam." It is recorded that Baird, who was an extremely big man, was taken prisoner in one of the campaigns. The news reached his mother of his capture, with the added information that the prisoners were chained together in pairs, whereupon she exclaimed: "Lord help the chiel that's chained to oor Davie." Baird's name occurs frequently in the pages of the prescription books. Another son of Mars, less famous, appears over pills composed of extract of colocynth, scammony and rhubarb, suggesting that Colonel Fotheringham of Poona brought home into a retirement an impaired liver.

Though in many respects the drugs in general use are not unfamiliar to those old enough to recall pharmacy of thirty years ago, there is evidence of a knowledge and use of Latin which has sadly declined:—

℞ Infus Rosae ℥iv
Mag. Sulph. ℥ss
Aq. Pimenta. ℥iss
Tinct. Senna Co. ℥ss m.
Sig; Sumat cochlearia mag. iii altern. auroris.

(Aurora, aurorae—The break of day; redness of morning. Whether Aurora, the goddess of morning, looked on with approval is open to conjecture.)

In general, there is a preponderance of stomachics and purgatives, conveying the impression that possession of a title was not without certain disadvantages. Confidence in the pharmaceutical service at 73 Princes Street is silently but eloquently expressed by the appearance of the name of Mr. Capel Hanbury. But a look through the names of patients is not only a tribute to the pharmacy—it is also an indication of the calibre of the inhabitants of the city. Mr. Brougham, of 68 Queen Street, was a future Lord Chancellor. Sir Henry Raeburn, the famous painter, appears in one of the books by reason of the following eye lotion:—

℞ Sulph. Zinc gr. iii
Aq. Rosae ad ℥iv
f. collyrium

Raeburn's studio was situated at 32 York Place, a property close to the headquarters of the Scottish Department of the Pharmaceutical Society, and now owned by the Society.

A famous Edinburgh doctor is recalled by a prescription for Lady Marjoribanks:—

℞ Pulv. Aromat. gr. v
Oxyd. Bismuth. Alb. gr. xv
m. ft. dos. et mitte tal. No. xxiv

The prescriber was Professor James Hamilton, jun., who had succeeded his father as Professor of Midwifery at the University. Hamilton had a fashionable practice of a lucrative description which enabled him to give his services gratis to a large number of people in straitened circumstances. (He is not to be confused with James Hamilton, sen., known to this day for a pill compounded of colocynth and hyoscyamus.) Lady Marjoribanks' medical attendant was easily remarked in the city by his continuing to use, as a means of transport, a sedan chair. Such conveyances were almost essential in the Old Town in earlier years, in the narrow closes and wynds, but by 1930, the year in which Hamilton ceased to use his chair, his had for long been the last survivor. Whether the professor was indulging a preference or was using a subtle form of attracting attention is difficult to say, for there were many personal idiosyncracies attaching to members of the profession in the seventeenth and eighteenth centuries. There was even one conspicuous medico who was accompanied on his rounds by a sheep and a raven. Hamilton's sedan chair is to be seen in the National Museum of Antiquities in Queen Street.

A close study of the prescription books reveals that between the 1820's and the 1920's little change took place in prescribing habits, many of the drugs used in the early nineteenth century retaining their popularity into the twentieth. The impression gains ground however, that there were digestive penalties attaching to rank and title, for it must be remembered that overeating was as common in the higher branches of society as under-nourishment was at the other end of the scale. But not all prescriptions were for internal use, and one or two indicate that the chemist was actively connected with cosmetics. He prepared the aids to beauty to individual requirements, with the exercise of skill and, it must be recorded, considerable physical effort. For example, Lady Beresford, for the expenditure of 14s. achieved (or preserved) the white hands demanded by society, by the use of an almond paste:—

℞ One pound of Bitter Almonds, blanched and pounded
One pound of Raisins, stoned and pounded
The Yolk of one egg, well beat up
A quarter of a pint of brandy
A quarter of a pint of sweet oil
Half an ounce of Honey
One ounce of Spermaceti
Mix all well together and put in a pot.

But, for internal use, pills were popular and plentiful. One such, containing rhubarb and caraway oil massed with syrup of rhubarb, is a reminder that the gentle art of delicate description is not the monopoly of modern manufacturers. The pills were sold under the genteel name of "Dr. Kitchener's Peristaltic Persuaders."

But Edinburgh of those early days was not composed entirely of New Town, nor was it peopled exclusively by rank and title. A short distance away, separated from Princes Street by the castle rock, lay the West Port, once a gateway to the old city. In 1828—a year after Baildon appeared on the Edinburgh scene—Old and New Edinburgh alike were shocked by the disclosure that two men, called Burke and Hare, had delivered at least sixteen murdered bodies to the anatomy rooms of Dr. Knox, the anatomist. Their names live, for the close in which the murders took place is still referred to as "Burke and Hare's" though identified under a totally different description in the Post Office Directory.

Financial Success

Cash books of the early Baildon business indicate a thriving concern with, for that time, a high average annual turnover of about £3,000. That figure must be viewed in relation to the value of money at the time. Today, one so placed would be unlikely to contemplate the purchase of a phaeton, for the sum of £30, not to weigh more than 4 cwt., in black, edged with pale yellow, green livery, and wheels 42 in. and 32 in. Nor is it likely that there would be sufficient surplus to indulge in debentures in the South-eastern, the Manchester and Sheffield, and the Caledonian Railways.

Encouraged by his success, Baildon opened a pharmacy in the adjoining seaport of Leith, but the venture did not prosper. The cashbook of the Leith branch shows a consistently poor return, made poorer by the need for the laconic entry at the end of one week, "Shop broken into and cash stolen." The branch, situated at Bernard Street, Leith, was disposed of in 1839 to Duncan, Flockhart & Co. (later Duncan, Flockhart, Powell & Co.) and H. C. Baildon would have been surprised to learn that there is a pharmacy—Powell & Co.—on the same premises to this day.

FINAL CURTAIN: Its windows empty, its stock in trade removed, its blinds down or half down, the once famous pharmacy of Baildon's awaits, in the picture, its conversion by a new owner.

The books of the firm are extremely well kept in the greatest detail, both business and personal expenses being carefully noted. Consequently, there was no difficulty in finding, under the date of September 15, 1859, an item which reads: "Chemist & Druggist—2/6d." H. C. Baildon was therefore an original subscriber to the new pharmaceutical periodical one hundred years ago.

The premises at 73 Princes Street have a much wider importance pharmaceutically than is perhaps generally known, for it was at that address that a meeting was held in 1851 to nominate the first board of examiners in Scotland. Baildon's friendship with Jacob Bell, added to his high reputation in the profession, resulted in a close association between the young Pharmaceutical Society and the building in Princes Street. For the first four years of the Society's life, its North British Branch found accommodation in rooms above the pharmacy, and there, also, the first evening scientific meeting was held.

A Pharmacist of Outstanding Ability

But, allowing for the fine situation of the pharmacy in Princes Street, more is required than site to attract and hold a *clientèle* such as is recorded in the prescription books. And that something more in the early days of the firm was Henry Craven Baildon. H. C. Baildon was, as already stated, an Englishman. He was born in Coventry in the first decade of the nineteenth century, and at the early age of twenty-two he came to Edinburgh to manage the pharmacy for Butler & Co. Organised pharmacy in Britain owes a great deal to his vision and enthusiasm, for he was a founder member of the Pharmaceutical Society. But, though an Englishman, and an enthusiast for the Pharmaceutical Society of Great Britain, he was staunch in his support of the need for proper recognition of the importance of the country of his adoption in the world of pharmacy. He it was who was the prime mover in the acceptance by Jacob Bell of the justice of a separate board of examiners for Scotland, and it was largely due to his efforts that a separate clause was inserted in the Pharmacy Act of 1852. Jacob Bell, and those associated with him, had pressed for a central examining board for the United Kingdom, with headquarters in London, but Baildon and his friends in Edinburgh threatened to oppose the Bill if their conditions were not accepted, going so far as to threaten a separate Society in Scotland. Bell ultimately, after a meeting in 73 Princes Street, conceded the justice of the Scottish position, and a separate board of examiners in Scotland came into being. As one would expect, H. C. Baildon was an examiner for many years, and was president of the North British Branch of the Society on two separate occasions, first in 1853-54 and again during the visit of the British Pharmaceutical Conference to Edinburgh in 1871. At that meeting he introduced the bark of *Rhamnus frangula* to pharmacists. Other communications were given by him to scientific evening meetings in the city, and he clearly was a pharmacist of outstanding ability. He has been described (*C. & D.*, January 15, 1881) as "warm-hearted, kind, genial and hospitable, in manners and disposition a perfect gentleman." To enter the present premises of the Scottish Department is to be reminded of momentous days, for one passes between busts of H. C. Baildon and Jacob Bell.

H. C. Baildon was succeeded in the business by his son, Henry Bellyse Baildon, but the younger Baildon's inclinations lay elsewhere, despite the fact that he was a member of the board of examiners for four years and a member of the Council of the Pharmaceutical Society for two. His leanings took him into literature and to the post of lecturer in English language and literature at the University College, Dundee. After taking his degree as Doctor of Philosophy at Freiburg, he lectured for a time at the Imperial Institute of Vienna. He published several books, one of which was a collection of lectures he had delivered to the Pharmaceutical

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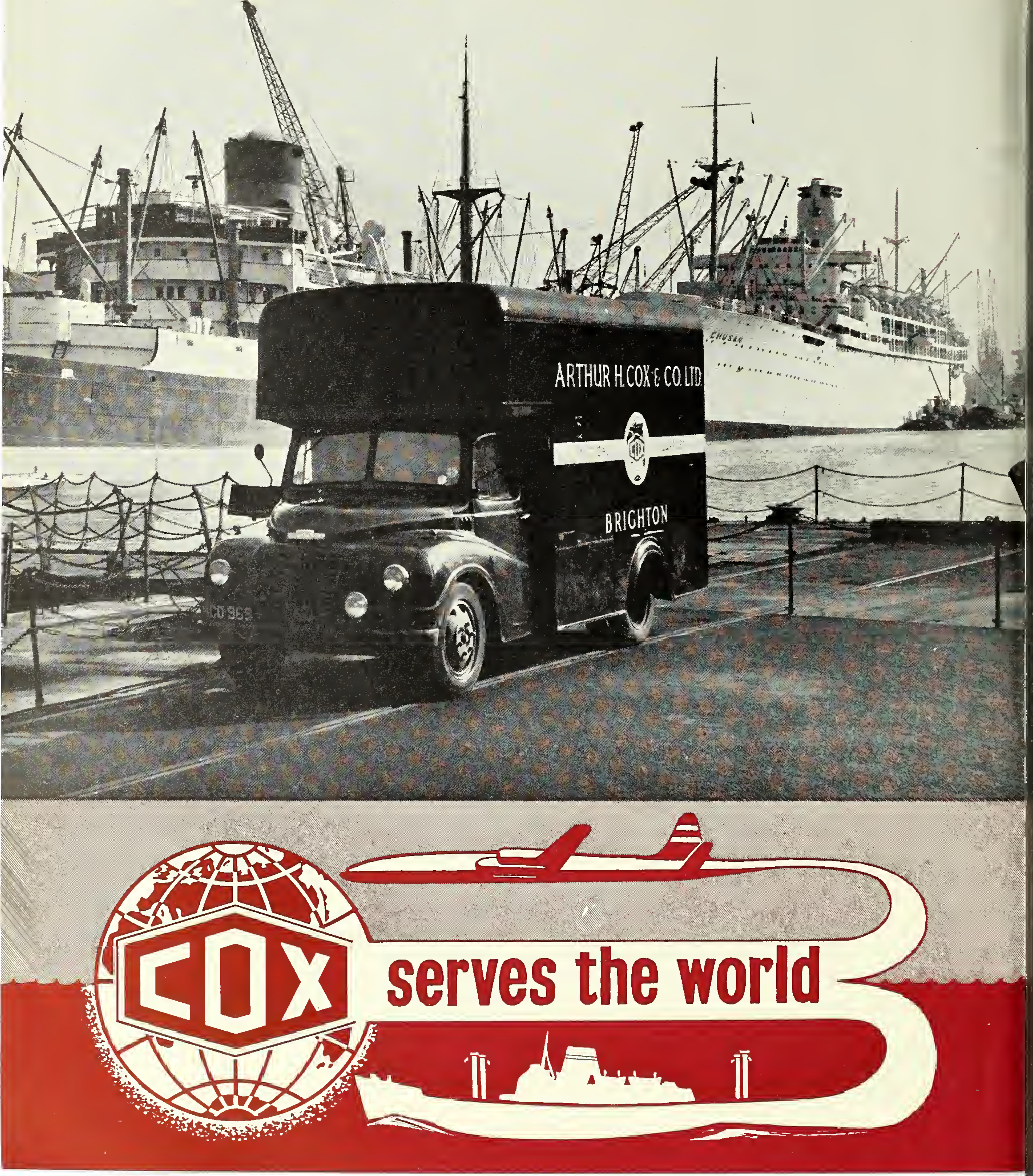
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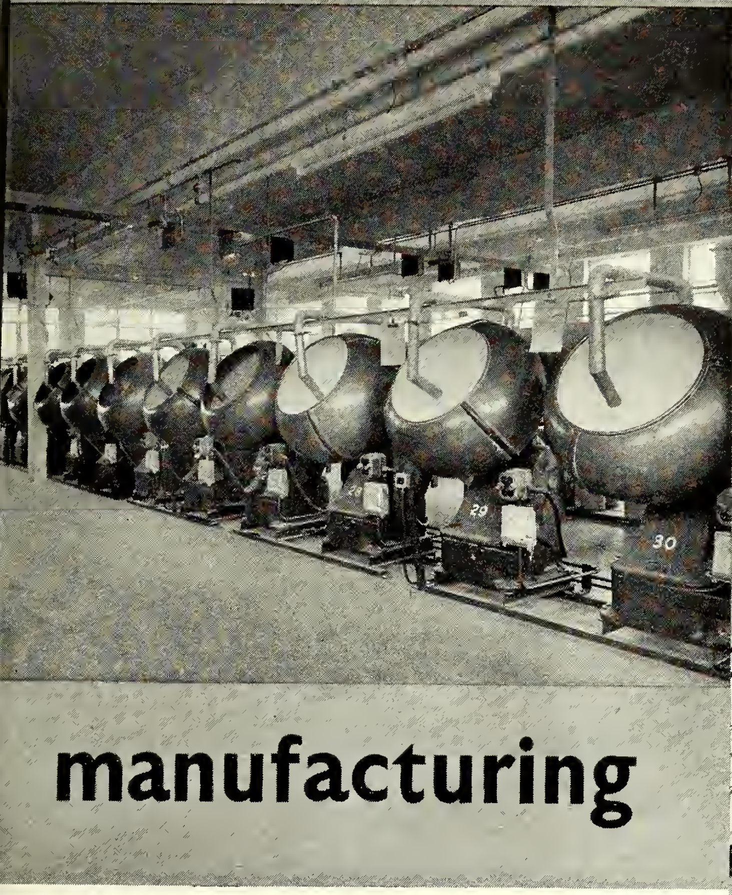

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Society in York Place. Another of his works was "Robert Louis Stevenson: A Life Study in Criticism"—a work for which he was admirably fitted by his friendship from youth with R. L. S.

Dr. Baildon's departure from pharmacy severed a business partnership with Robert Aitken, who became proprietor of the firm of H. C. Baildon. Robert Aitken had been assistant to H. C. Baildon before qualifying in 1869, and after London experience his services were sought as manager by Baildon. The choice was sound and the tradition was maintained, for Aitken was a contributor to early issues of THE CHEMIST AND DRUGGIST on the subject of the use of the microscope in pharmacy, and on galenical problems. On the death of Robert Aitken in 1927, his son, A. Campbell Aitken, succeeded. A. C. Aitken qualified in 1903, and continued to run the pharmacy at 73 Princes Street, together with a branch at the West End, until his death in 1958. It is of interest that both Baildons and both Aitkens laid the foundations of their successful careers with John Bell & Co., Oxford Street, London.

About eighty years ago the firm engaged, as a sideline, in the manufacture of aerated waters. That sideline has now become the sole activity, and the sole agency for keeping the name H. C. Baildon in the eye and mind of the citizens of Edinburgh. Changes in the character of Princes Street have made inevitable the disappearance from the scene of a pharmacy which shone brilliantly for many years as the symbol of all that is good in pharmacy. To the name of Baildon's of Edinburgh there must now be added that of Fraser & Green of Glasgow, for both, after more than a century of service, have vanished from the scene. The curtain has descended and the play has come to an end in what, for those who venerate tradition, can only be regarded as tragedy. But though the pharmacy has gone, the light of Baildon's example will continue to shine through pharmacy in the capital of Scotland for all time.

Genetic Effects of Radiations

THE ten years that followed the foundation of The CHEMIST AND DRUGGIST saw the publication of two scientific papers that were to have a profound effect on the development of biological thought. In 1865 the Moravian monk Gregor Mendel read before the Natural History Society of Brünn a paper in which he described the results of crosses between varieties of the garden pea; from those results he had deduced what proved to be the two fundamental laws of inheritance. In 1868 the German biologist August Weismann published the first of a series of essays on the mechanism of heredity and the rôle of the germ-plasm. By the turn of the century, largely as a result of Weismann's work, it was widely suspected that the hereditary constitution of an individual is determined by the nature of the chromosomes in the egg and sperm from which he develops. The final proof, which was based on Mendel's work, was obtained ten years later. It led to realisation that the heritable variations which are found in every species are due to spontaneous changes (mutations) in the chromosomes and their constituents, the genes.

Chromosomes, Genes and Heredity

But if the chromosomes and genes determine the hereditary constitution, it should be possible to alter the hereditary constitution by inducing mutation in the chromosomes and genes. Between 1910 and 1927 many experiments were made in attempts to discover agents capable of inducing mutation. *X*-rays were among the first to be tried, since it was certain that penetrating radiation could reach the genes, whereas chemical agents might be stopped by the outer parts of the cell. The first *x*-ray experiments, using mice, were unsuccessful; but in 1927 the American geneticist H. J. Muller published convincing evidence of the induction by *x*-rays of hereditary changes in the fruit-fly *Drosophila,* and since that date the induction of mutation has been demonstrated in an enormous number of experimental organisms and by all types of ionising radiation. We cannot now doubt that mutations are induced when human germ cells are exposed to ionising radiations. Furthermore, since 1944 many chemical substances have been discovered which cause mutation if they reach the germ cells of experimental organisms. They include some substances in common use, such as maleic hydrazide, which is widely used in horticultural sprays. In *Drosophila* even formaldehyde has quite a powerful mutagenic action, when added to the food of the larvæ; but it is unlikely that formaldehyde could reach the germ cell of man.

Laboratory experiments have shown that the induction of hereditary changes by radiation obeys certain laws. The great majority of changes are harmful. There is no threshold for induction, so that any exposure, no matter how small, induces some mutation, and the amount of mutation induced is proportional to the radiation dose. Mutation, once induced, is irreversible ,so that an individual exposed early in life, and even as a fœtus, will show an enhanced mutation rate when eventually he breeds, even if it be many years later. A given dose of radiation may induce more mutation if delivered at a high intensity (e.g., from a diagnostic *x*-ray machine) than at low intensity (e.g., from nuclear-test fall-out).

Mutation in Man

The same laws probably apply to mutation induced in man. We know that many of the diseases occurring in human populations are of a hereditary nature due, at least in part, to spontaneous mutation in past generations; and we must expect that their incidence will be increased if mutation is increased through exposure to radiations or chemical mutagens. The diseases include some forms of mental illness, mental defect, blindness, deaf-mutism and diabetes, in addition to the diseases more commonly recognised as genetic in nature, of which haemophilia is the best-known example. Altogether about 4 per cent. of all children born suffer, or will at some time suffer, from a defect that is partly or wholly of genetic origin. This means that in Great Britain about 30,000 such children are born each year. By how much that number would be increased by any given radiation exposure cannot be predicted with any confidence, but the 1958 report of the United Nations Scientific Committee on the Effects of Atomic Radiation suggested that a radiation dose of between 10 and 100 units would be required to induce as much mutation as occurs spontaneously in each generation. The additional radiation dose received from all man-made sources by the average Briton totals at least 0·75 units per generation, according to the Medical Research Council's 1956 report "The Hazards to Man of Nuclear and Allied Radiations," so it appears that the mutation rate of our genes may have been raised by something between 0·75 and 7·5 per cent. That does not mean that the incidence of hereditary disease will increase by that amount immediately; but it does mean that some or all of it will do so over the course of many generations if exposure continues at the same rate indefinitely.

If mutation is the inevitable consequence of radiation exposure, and if most mutation has harmful consequences, it is imperative that an answer should be found to the question: How can radiation exposure be reduced ? Fortunately that may not be difficult. More than 90 per cent. of the radiation exposure of human germ cells occurs in medical radiology, and recent investigations have shown that much of it can be avoided by relatively simple precautions, such as shielding the testes or ovaries with lead, especially during diagnostic examination of the abdomen, hips or thigh. It is to be hoped that the knowledge and routine practice of such precautions will spread rapidly throughout the community.

Famous Physick Gardens

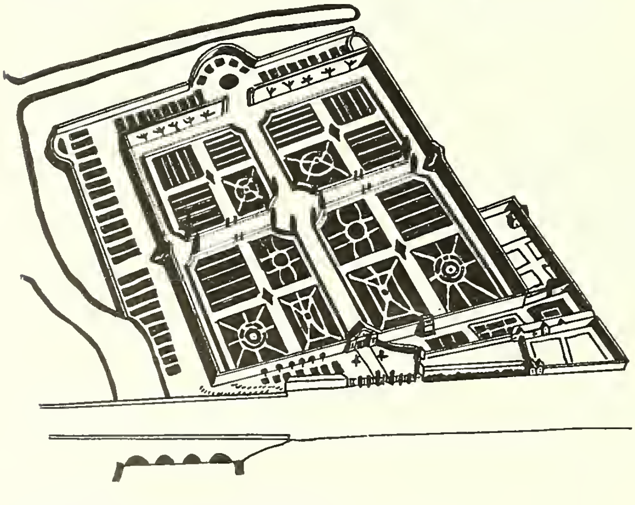
OXFORD AND CHELSEA THROUGH $3\frac{1}{2}$ CENTURIES

The Seventeenth century, which saw a great awakening of interest in natural science, also saw the establishment in Britain of two great Physick Gardens that have survived and flourished on their original sites to the present day: those of Oxford and London.

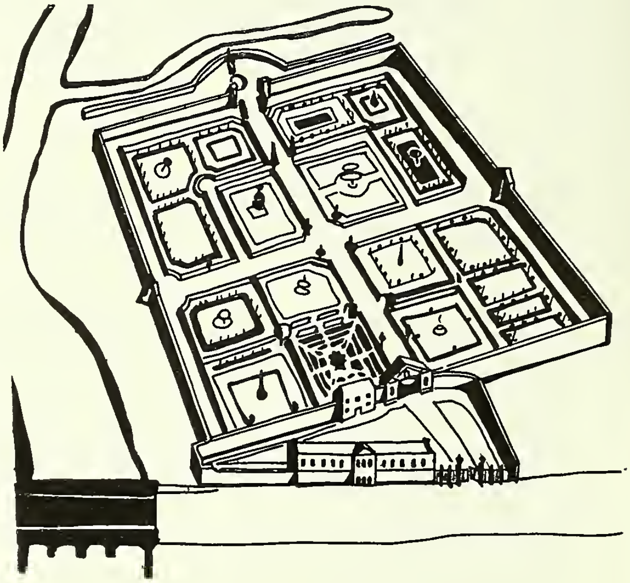
1. THE BOTANIC GARDENS, OXFORD

"BEING minded to become a benefactor," wrote Henry, Lord Danvers, Earl of Danby, in 1621, when he advanced the money to found a Physic Garden at Oxford. The original wall surrounds the three-and-a quarter acres which has received care and attention for 338 years. The Cherwell flowing down to meet the Thames and providing a natural limit to Christchurch meadows was only a few hundred yards from the East Gate of the City; the intervening ground, belonging to Magdalen College, was marshy but suitable for the purpose that Danby had in mind, and as a result he secured the lease. A ceremony on the afternoon of July 25, 1621, laid a foundation stone and completed formalities.

The ground at that time was marshy, and considerable effort was required to raise the ground level, construct the wall and provide the principal gate, which is dated 1632. Loggan's plan of the garden in 1675 gives an idea of the geometrical designs used in planning the beds, each of which was enclosed by box hedges. Lord Danby died in 1644, and four years later the garden catalogue was published, listing 1,000 foreign species and 600 British plants. Jacob Bobart was appointed the first gardener in 1641, and the small endowment that was required to cover expenses required the Bobart family to depend to some extent upon the sale of garden produce. He was recognised as an excellent gardener and botanist, and was responsible, with others including his son, for the second edition of the catalogue "Catalogus Horti Botanici Oxoniensis" in 1658. In 1654 the sensitive plant *Mimosa pudica* created a stir and the records state that Robert Sharrock, a Fellow of New College, was successful after numerous attempts to graft "vines, one upon another."

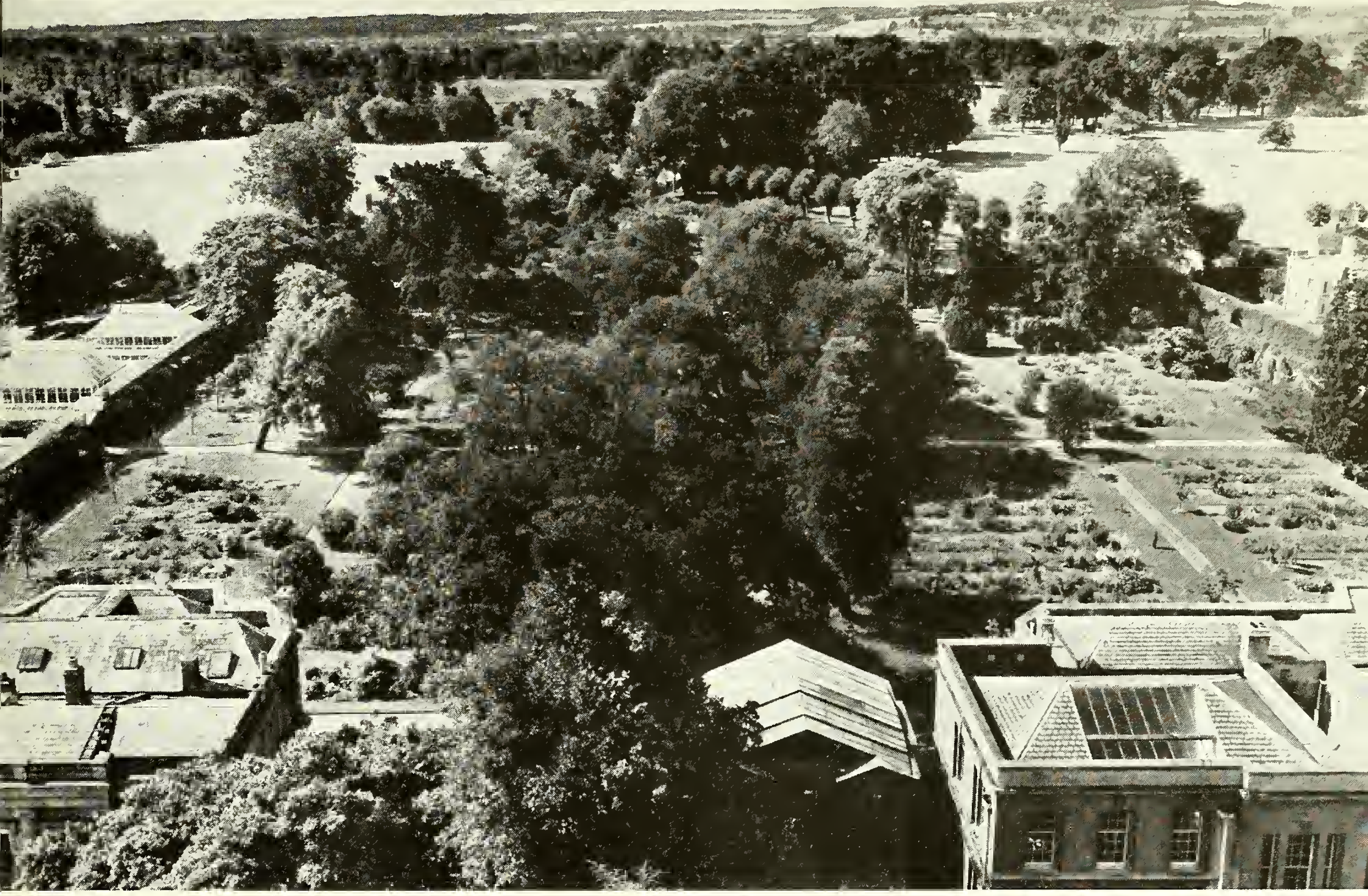


The gardens in 1675 (after Loggan).



The gardens in 1733 (after Williams).

The younger Jacob Bobart became Professor of Botany in 1683 and was the first to circulate a seed list. He was well respected by his contemporaries, corresponded with Sir Hans Sloane, and was applauded in poetry, and the grass genus *Bobartia* was named after him. The arrangement of the garden within the four walls was eventually changed from the quadrilateral design towards the end of the eighteenth century. The geometrical, box-hedged flower beds of intricate design adorned with trees and shrubs clipped to eccentric shapes followed the current fashion until that change. The great Linnaeus saw the garden in that form, though his Oxford visit was by no means a success. In 1734 he makes reference to two greenhouses in the course of a letter to a Dr. Richardson, and those still exist as the two buildings fronting the High Street. The expansion of interest, increased numbers of students, and expansion of the subject led to the removal of the botany department to other parts of the University. Dillenius, appointed Sherardian Professor of Botany in 1734, received Linnaeus but arranged to

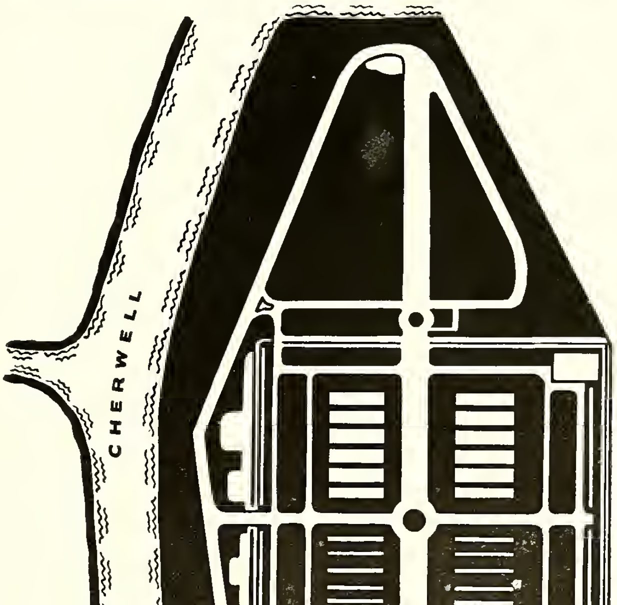


A view of the gardens today, showing the original wall-bounded garden; the river frontage with the glasshouses; the triangular shaped extension; Christchurch Meadows beyond; and in the distance Boar's Hill and the Berkshire countryside. (Compare with modern plan diagram)

give him little attention during his visit of a month. The Professor disagreed with the great botanist's classification even to the extent that he considered Linnaeus' "genera" to have been written against his own views. A chance meeting between the two men in the presence of Dr. Sherard led Dillenius to speak slightingly in Latin of the visitor. Linnaeus responded at a suitable opportunity by demonstrating his "genera" from plants in the garden. Though he failed to win Dillenius over they achieved recognition of each other's abilities to the extent that Linnaeus founded the genera *Dillenia* "of all plants the most distinguished for the beauty of its flowers and fruit, like Dillenius among botanists." During his time the garden contained examples of true African rhubarb; an aloe plant; Indian tobacco plant; wheat; a pepper tree; *arbor Balsami Peruviana;* and a currant grape grafted upon the fox-grape.

Dr. Sibthorp succeeded to the Professorship. He was reported as giving a not very successful lecture, whereupon scientific activity lapsed for the forty years of his custodianship. His son Dr. John Sibthorp, who was appointed to the chair, is remembered for his zeal, his travels abroad, and his collection of plants, the organisation of which was not completed until many years after his death.

The garden about that time, and despite the heroic efforts of gardeners, fell into a state of disrepair and neglect—a situation that was overcome by Dr. Charles Giles Brindle Daubeny. Daubeny had a European reputation arising from his book upon volcanoes and atomic theory, possibly surprising qualifications for a professor of botany, but his work for the garden pays tribute to his electors. He respected the requirements of earlier benefactors who desired space to be devoted to plants of economic value. Daubeny lived at the garden, and at one time kept monkeys, which he was pleased



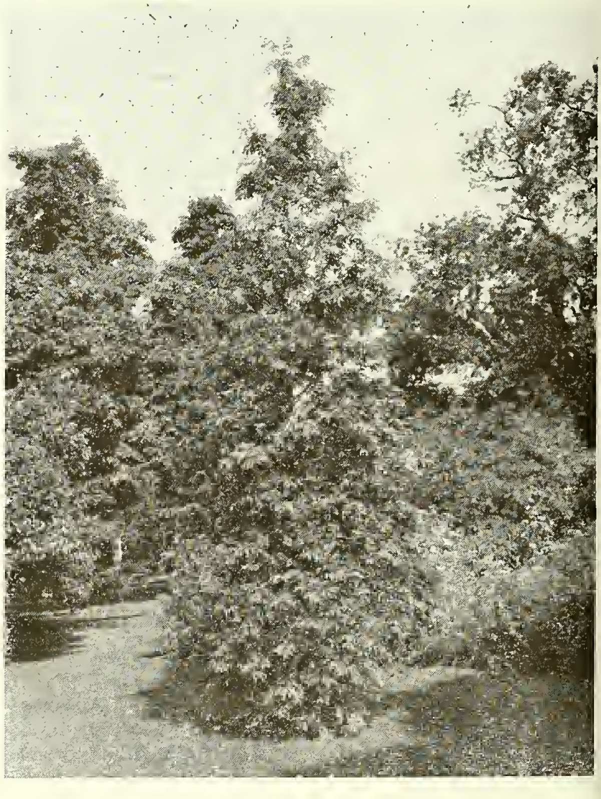
A plan (not to scale) of the modern garden. Compare with 1675 and 1733 plans.

to show guests at receptions held there. Between 1873 and the end of the century the removal of the garden to University Parks, in closer companionship with the other sciences focusing on South Parks Road, was considered. Fortunately the move did not occur, and the heritage of the garden, within its original and ancient walls, remains. The limitations of space, recognised for many years, was eventually eased during the 1939-45 war, when a triangular-shaped addition allowed the area of cultivation to be approximately doubled.

Near the river gate of the Oxford botanical gardens is a tree that is a botanical chimera. On to a root stock of the hawthorn was grafted a common medilla. During July and August three different fruits may be found within the branches: the originals—medilla and hawthorn fruits—and an intermediate identical with the common wild medilla.

ABOVE:

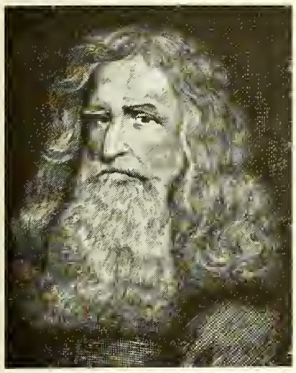
The Gingko Biloba tree in the Oxford botanic garden is unique. Almost central in the illustration, it dwarfs the 10-12 ft. high bamboo plants at its feet. The darker shading and colour of the plant near the tree are to be noted: it is the Japanese-derived Arundinaria fastuosa *which is in flower. The production of an inflorescence is rare, and the scattering of specimens in botanic gardens throughout the country prevents fertility and therefore seed. The flowers appearing in July suggest the plant will be dead in September. The flower beds nearby are devoted to economic botany, and essential oil as well as drug plants are grown there.*



AT RIGHT:

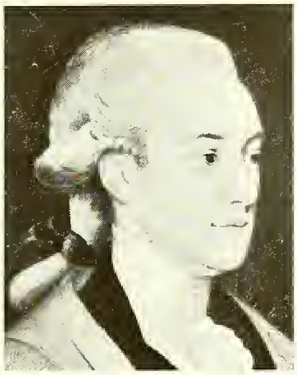
The fossil conifer, also known as the dawn redwood. The tree was rediscovered in 1947, and its importance is such that it might also qualify for the description "the botanical coelacanth." The species flourished before the appearance of the earliest cave-man.

PERSONALITIES ASSOCIATED WITH THE BOTANICAL GARDENS OF OXFORD AND CHELSEA


J. Bobart the elder (1599-1680)

J. Bobart the younger (1640-1719)

J. J. Dillenius (1687-1747)

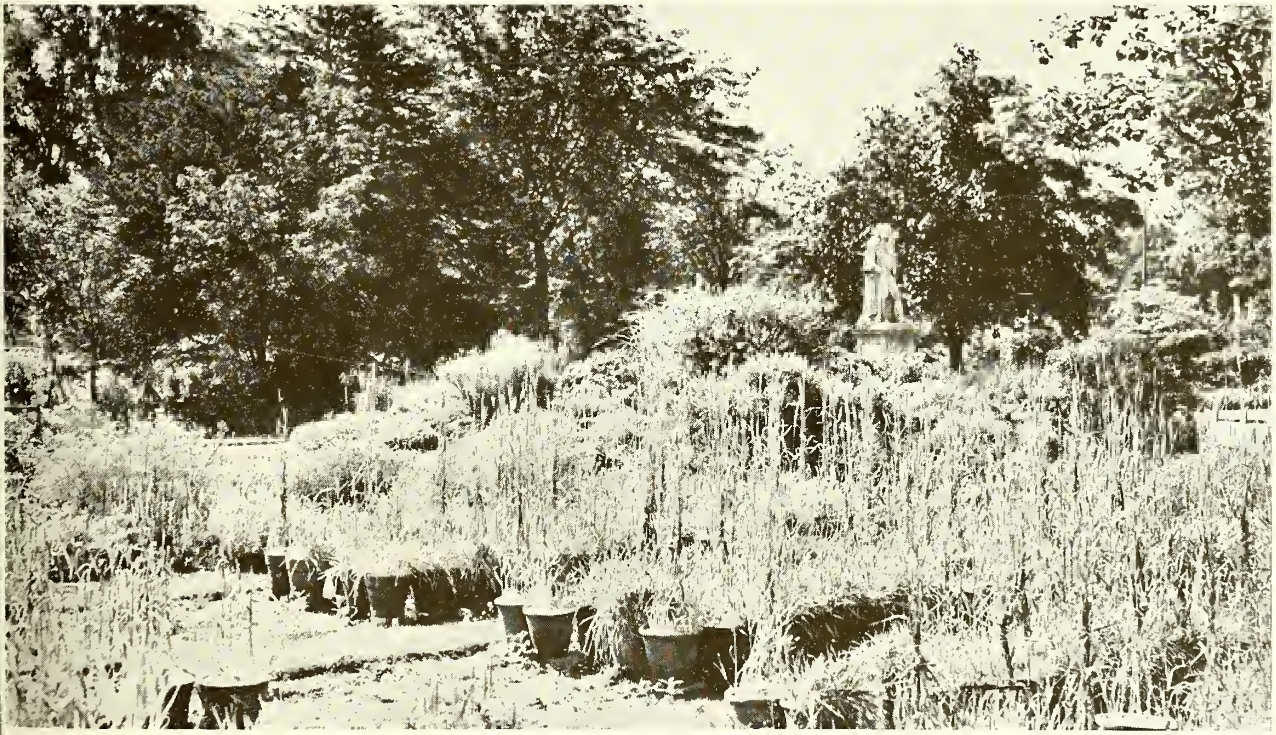

John Sibthorp (1758-96)

C. G. B. Daubeny (1795-1867)

Sir J. Banks (1743-1820)

Sir Hans Sloane (1660-1753)

Nathaniel Ward (1791-1868)


The centre of the Chelsea botany garden, with statue of the founder Sir Hans Sloane. In the foreground, part of the experimental work upon photoperiodicity. Beyond, part of the order beds, with the rockery containing the lava rocks presented by Sir Josiah Banks. The main aquatic plants pool surmounts the rockery.

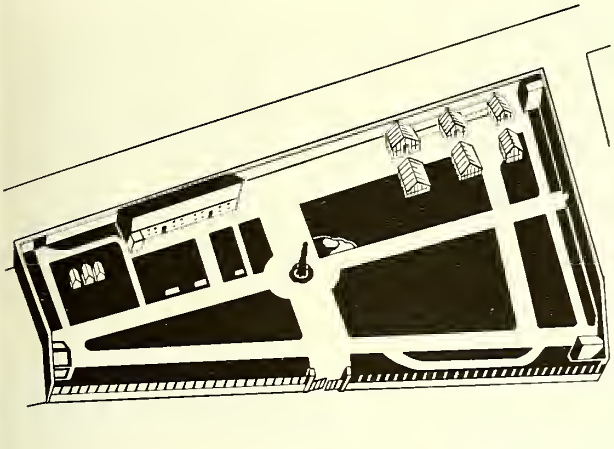
Order beds showing the extent of the Garden's work which is extensive in spite of the limitations of space. In the pharmaceutical students' order bed in foreground towards the left are Papaver somniferum *and* P. rhoeas. *Immediately to the right is a sturdy specimen of* Glycyrrhiza glabra; *beyond the poppies the flowers of* Althara officinalis; *unseen behind the* Althara *is a plant of* Brassica alba, *as well as* Hyoscyamus niger, Datura stramonium *and other plants with drug-yielding leaves.* Rheum officinalis *is obvious, and the comparatively rare* Gingko biloba.

Photoperiodic experimental work. The trucks, loaded with plants, travel on rails into the black-out huts. Note the curtains and the tiny white label tags upon each plant. The seemingly empty pots contain germinating seeds.

The removal of the laboratory and abandonment by the botany department of the buildings represent the last of the changes that have occurred in the history derived from the original bequest of the founder Danby.

At present the economic botany plant bed will not satisfy the seeker for modern medicinal plants. Most plants of pharmacognostical interest are present but they are spread throughout the garden and require discovery. Useful botany notes upon plants are in Gunther's' book upon the garden, published in 1914 and now out of print, but it should be remembered that many garden plants were introduced in the last or previous centuries.

On the stone work beside the Swan Walk gate of the Chelsea Physic Garden is the inscription HORTUS BOTANICUS SOCIETATIS PHARMACEUTICAE LOND. 1686. The more imposing gateway, flanked by iron railings, facing the Chelsea Embankment in London is the site of another stone embedded inscription which reads "The Botanic Garden of the Society of Apothecaries 1673." The latter announcement remains accu-



Diagrammatic plan of the garden "viewed" from Chelsea Embankment and showing the dominating Sir Hans Sloane Statue.

rate today and could equally well carry the date 1959.

For 326 years botanists (the garden was established in 1633) have been able to come to the site for study and research. The Society of Apothecaries leased the ground, and the faith and hard work of enthusiastic botanists overcame the doubts and questions of succeeding committees as to the wisdom of the project. Expenses mounted, and disputes as to land ownership discouraged the Society from making capital investments, but botanical enthusiasm overcame the difficulties of expense by exchanging specimens—at first with Dr. Herman of Leyden, who visited the garden in 1682, and later with other botanical gardens and private botanists who frequently returned from the East or the tropics with seeds or plants. In those early days the library was started; the first record of it dates to 1633, when a Mr. Thomas Johnson of Snow Hill presented the Society with a copy of Gerard's Herbal. Records of library additions are sparse for almost fifty years. The Great Fire of London may have influenced both library and records but the Society of Apothecaries rebuilt its chemical laboratory in 1671, and in 1681 considered increasing the number of its books to assist the work of the laboratory. Cases for books presented by Dr. Samuel Dale of Braintree in 1739 are still in use and contain the original volumes.

The exchange system of enlarging and widening the plant collection continued, and in 1771 the work of Philip Miller was acknowledged. Miller unwittingly influenced history by dispatching to Georgia in 1732 a packet of cotton seed. His seeds grew into the cotton industry in the Southern States of America. The fame that had come to the garden even drew the great Dr. Linnaeus, who visited it and the Oxford botany garden in 1736. Unhappily Linnaeus acknowledged his own ability with repetition and emphasis and made himself unpopular thereby. Two of the students taught by Linnaeus also visited the garden. The first was the Swedish Peter Kalm, who was famous at the time, and a Danish student J. C. Fabricius, who later became the Professor of Natural History at Keil University. His work and observations eventually led to the establishment of the modern science of entomology.

Lava from Iceland

The garden influenced others, and during the early half of the nineteenth century a Chelsea boy, Joseph Banks, learned the Latin names tagged upon each plant. That early introduction to botany may have turned his attention in later years to the study of natural history. Joseph Banks sailed with the great Dr. Cooke upon his explorations, and in time became Sir Joseph. His travels took him to Iceland, where he collected and brought home a considerable quantity of black lava rock. In 1772 the garden received that gift as the basis for a rockery for alpines. In the illustration showing the statue of Sir Hans Sloane the rockery can be seen.

Signs of age such as the worn stones, weathered by 300 winters, are evident, but there is no decay, and research projects today are better for maturity and knowledge gained in those years. The continued existence of the garden was ensured by the generosity of Sir Hans Sloane, whose medical practice in Bloomsbury contributed to the purchase of the Manor of Chelsea. Wisely his generosity was tempered by certain conditions which the Society honoured. Sir Hans laid down that the garden should provide fifty specimens of plants, most carefully dried, mounted and named, every year for forty years. That annual tribute was to be dispatched to the Royal Society. Sloane ensured thereby that the garden would, during those forty years, be enriched by at least 2,000 plants. The Society improved upon that intention, and obtained 3,000 specimens from that number of plants. The collection still exists; it is in the safe keeping of the Natural History Museum at South Kensington.

Three centuries are capable of producing many great personalities. Samuel Doody, an apothecary who worked in the Strand, assisted in the care and work of the garden from 1693 until his death in 1706; James Petiver, apothecary in Aldersgate Street and apothecary to St. Bartholomew's hospital, followed Doody. They are worthy of mention as both were Fellows of the Royal Society—then a new body brought into being by Charles the Second. At the time that Doody and Petiver worked in the garden Londoners were no doubt showing interest in four strange trees. Two were in the centre of the garden and another two stood upon either side of the Embankment gate. They were cedars of Lebanon, the first to be introduced into this country, and were planted in 1682. They derived from Dr. Herman and his exchange arrangements, the young trees travelling from the Lebanon via the Leyden garden. A curator Nathaniel Ward who died in 1868 was the inventor of the "Wardian" cases, boxes with a consistent moisture content and temperature that permitted the transport of plants undamaged in spite of long distances. The invention was responsible for the introduction of Chinese banana plants to Samoa and Fiji, the transport of 10,000 tea plants from Shanghai to the New World to the Old, eventually giving India that valuable Himalayas, and the carriage of cinchona plants from the plant.

A PHARMACIST'S ANTHOLOGY

CONFIDENCE IN RECOVERY

From *The Adventures of Roderick Random*
by Tobias Smollett

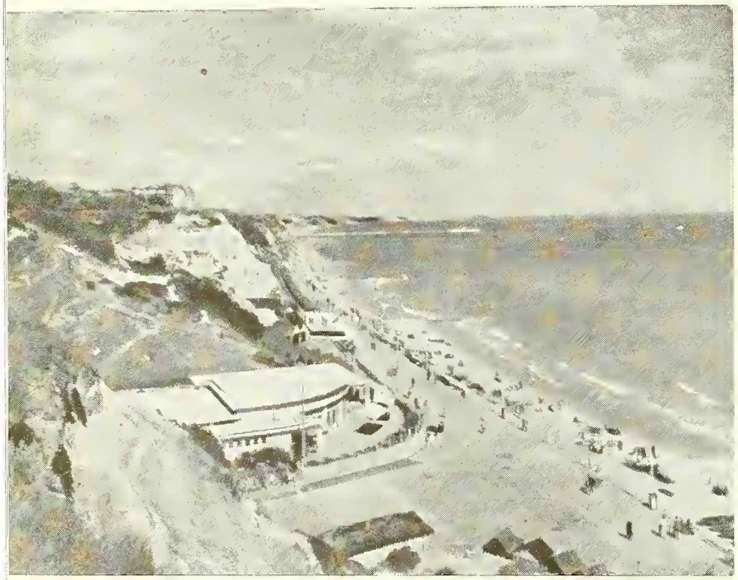
HERE I lay and enjoyed the breeze, notwithstanding which, my malady gained ground, and at length my life was despaired of, though I never lost hopes of recovery, even when I had the mortification to see, from my cabin window, six or seven thrown overboard every day, who died of the same distemper. This confidence, I am persuaded, conduced a great deal to the preservation of my life, especially, when joined to another resolution I took at the beginning, namely, to refuse all medicine, which I could not help thinking co-operated with the disease, and instead of resisting putrefaction, promoted a total degeneracy of the vital fluid.—When my friend Morgan, therefore, brought his diaphoretic boluses, I put them in my mouth, 'tis true, but without any intention of swallowing them; and when he went away, spit them out, and washed my mouth with water-gruel: I seemingly complied in this manner, that I might not afront the blood of Caractacus, by a refusal which might have intimated a diffidence of his physical capacity; for he acted as my physician, doctor Macshane never once enquiring about me, or even knowing where I was. When my distemper was at the height, Morgan thought my case desperate, and after having applied a blister to the nape of my neck, squeezed my hand, bidding me with a woeful countenance, recommend myself to God and my redeemer; then taking his leave, desired the chaplain to come and administer some spiritual consolation to me; but before he arrived, I made shift to rid myself of the troublesome application the Welchman had bestowed upon my back.

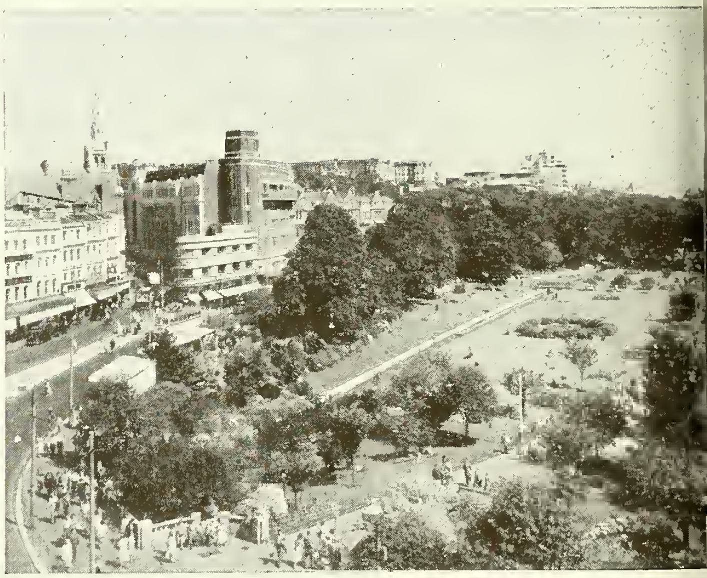
Conference Town 1959

BOURNEMOUTH, where the British Pharmaceutical Conference meeting is being held in September, has a more attractive geography than venerable history. Its chines—"the little ravines planted with trees and shrubs running inland from the coast, carrying sea breezes into the streets"—are permanent features, no less beautiful today than when they attracted the notice of Lewis Tregonwell about a century and a half ago—probably more beautiful, since the chines, like the valley of the Bourne and much of the coast, provided sites, no doubt, for some of the pines which he planted. Visitors from the North, if they come by rail on the romantically named Pines express, may well reflect that without Tregonwell there would have been no such train, for there would have been no pines. Two fine parks, Meyrick of 194 acres, and Queens of 175, are other natural town attractions.

Tregonwell is acknowledged to be the founder of modern Bournemouth, though its name is much older, dating back, it is said, a thousand years. In the early nineteenth century Tregonwell built himself a house on the river Bourne and settled there, commencing his beautifying work of afforestation. It was not long before a village grew up among the pines he planted, and from it the modern resort developed.

Of the wider geography of Bournemouth the characteristic features are a bathing beach six miles long, a noble headland within the urban boundaries, Poole harbour next door, and the New Forest not far away.





Opinions may differ as to the attractiveness of the town as an urban layout. Visiting motorists may often wish they could maintain their sense of direction among its tortuous streets and avenues or find parking space near its centre. An exceptionally high proportion of its houses, whatever their size, are detached, no doubt explaining the "air of opulence" the town is said to have. Bournemouth has indeed been described as a town of villas, mansions, hotels, boarding houses, pines and rhododendrons. Virtually its only industry is catering for visitors. The rhododendrons must be taken on trust in September, but Conference members will see plenty of the other listed items. Some of the visitors may even decide to swell the 2,000 or so persons who every year are added to the population of the town.

Bournemouth is renowned for its shopping facilities. In the parts close to the sea the shops are wisely kept concentrated, so that, while there are a lot of them, the town is also able to boast that its five miles of Overcliff Drive is shopless. Civically Bournemouth's outlook has always been modern. It was the first town in England to have electric trams, and likewise one of the first to do away with them. It early set an example in economy and tidiness in the way it disposed of its refuse. The intractable residue after incineration was admixed with cement and converted into paving stones. A wag might say that so true a sense of value of money must have persisted from the time, before the Romans came, when there was a British mint on Hengistbury head: its hearth, and dies used in minting the coins, were rediscovered some years ago.

So agreeable a residential area as Bournemouth could hardly fail to attract authors, poets and artists. There are in fact strong associations with Robert Louis Stevenson, Alfred Lord Tennyson, W. H. Hudson and above all Percy Bysshe Shelley, whose heart lies buried in a vault at St. Peter's Church, and whose former home in Boscombe is open to the public to visit. Whether Bournemouth's Russell Cotes Art Gallery is today more likely to attract antiquarians than artists seems in some doubt. The gallery contains a fine collection of pictures by nineteenth- and twentieth-century artists, but a critic more candid than kind has termed it "a remarkable shrine of obsolete taste—pictures, marble and statuary and *objets d'art.*"

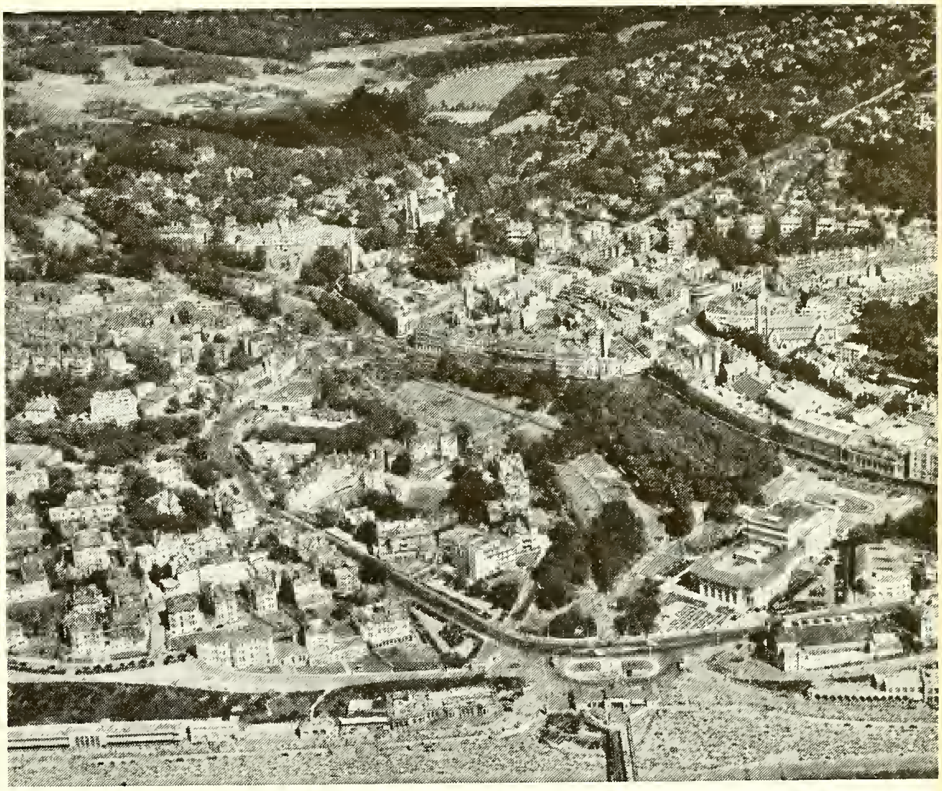
Bournemouth's Churches

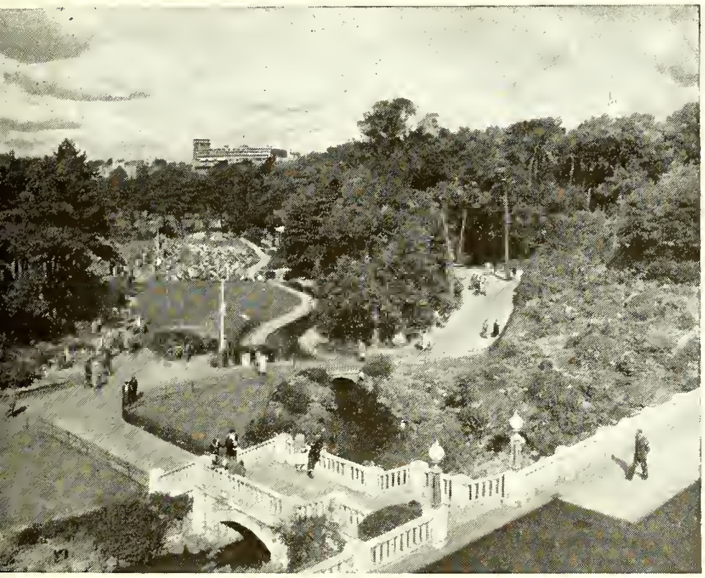
There is less doubt about the ability of Bournemouth to cater for the religious needs of Conference visitors. Anglicans have the choice of St. Peters, in the Gothic revival style of the architect of London's Law Courts, of stylistically distinctive St. Stephen's, by the architect of Truro Cathedral, or of many others. For Roman Catholics there is the Oratory of the Sacred Heart, with its altar of grey sculptured Italian marbles inlaid with lapis lazuli. To Nonconformists a visit to Richmond Hill Congregational Church may call to mind one of the most eminent of their leaders in the

THE ATTRACTIONS AND AMENITIES OF BOURNEMOUTH

past: Rev. Dr. J. D. Jones; or there is the Punshon Memorial Methodist Church which was completed only last year. Replacing a church on Richmond Hill that was destroyed by enemy action in 1943, it is extremely modern in design. Colour and modern materials have been used to full advantage, and there are such modern amenities as a garage underneath and a lift to the top of the tower.

Bournemouth has also many pharmacies of high standing and repute, some of them here illustrated. Indeed the number of pharmacies per 5,000 of population seems exceptionally high, and made more so by the degree of segregation of shops from houses to which reference has already been made. It seems to show that many pharmacists are willing to accept lower standards of income than their colleagues elsewhere,

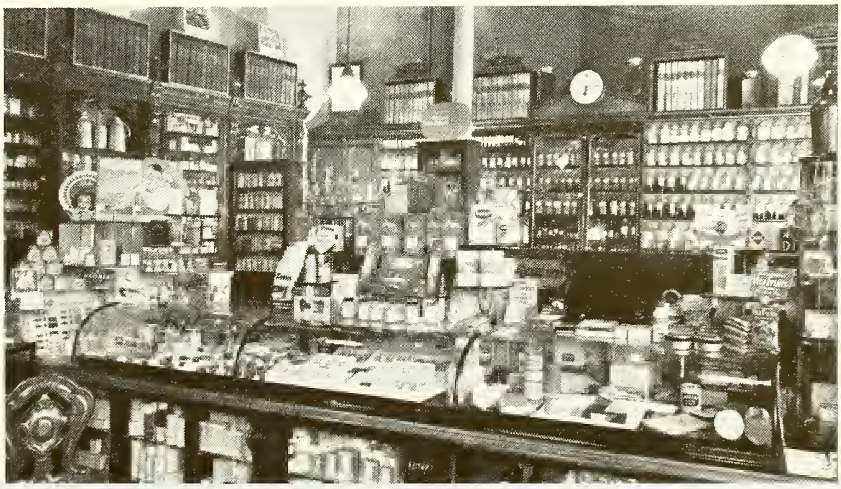


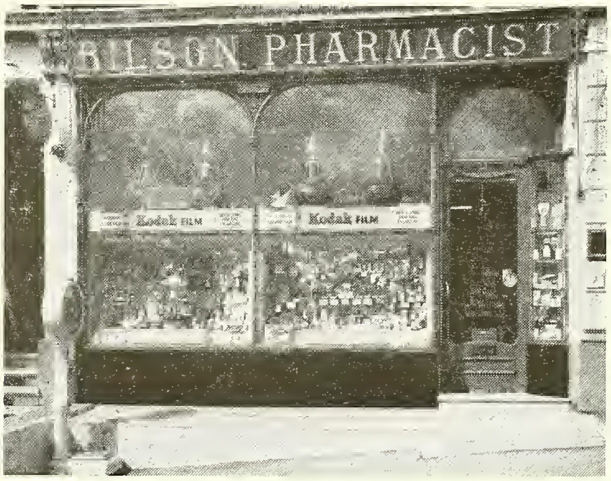


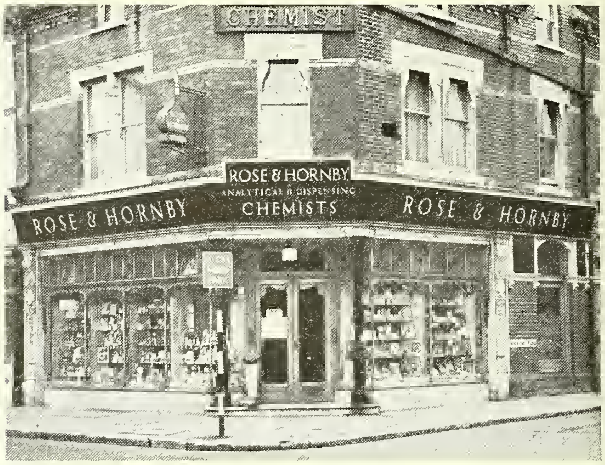
TOP RIGHT :
An aerial view of the town.

ACROSS PAGE :
The beach from Durley Chine.
The central gardens.
The pleasure gardens, from the Pavilion.
The Pavilion itself.

AT RIGHT :
Interior of the circular-fronted pharmacy of Pars & Co., Poole Hill. A feature is the array of cases of prescription books permanently displayed above the wall fixtures. The exterior has figured in the C. & D., *"Pharmacies of Britain" series* (C. & D., November 27, 1954)







can they but enjoy the amenities of so pleasant a resort. It is true, of course, that Bournemouth shops also serve a wide hinterland, from which customers come in by bus and car to do their shopping.

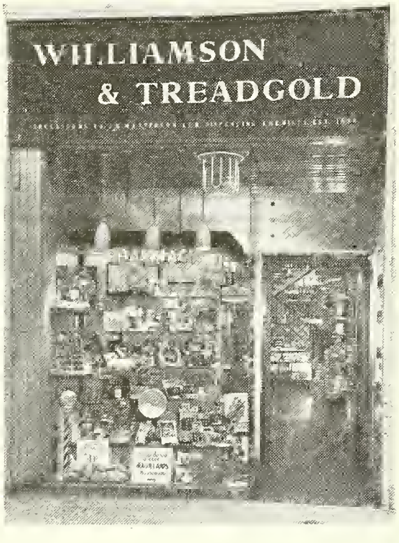
Close to where the river Bourne enters the sea is the Pavilion, where many of the Conference sessions and the one prearranged Conference luncheon are being held. The excellence of the Pavilion for the first of those purposes will not need to be stressed to those who attended the previous Bournemouth Conference meeting in 1936. Of the second it may be said that the town takes great pride in the gastronomic excellence of Pavilion catering.

Every conference meeting is attended by many who would be there whatever the venue and others who, having to treat the week as part of their annual holiday, must study carefully the attractions of the town selected for the meeting. Any who may be still hesitating need have no qualms about Bournemouth's charms on that score. Let them think only of the hundreds to whom Bournemouth is a holiday Mecca to be visited year after year.

Some Bournemouth Pharmacies

The pharmacy of Pars & Co., Poole Hill, Bournemouth (proprietor: Mr. A. E. Robinson) was built in 1876 but incorporates fixtures that are around 200 years old. It is one of the few round pharmacies—or indeed round shops—in the country, and its individuality has been carefully preserved. A feature of the interior is that prescription books dating from the foundation of the business are on display in a series of box-like fitments above the cornice of the wall fixtures. Specie jars and giant carboys are much in evidence, and a sign "aural technicians" gives the clue to an important department of the business: hearing aids. A dial at the end of one counter survives from the time when the pressure of gas from the mains supply could be regulated by the consumer. In the dispensary private prescriptions still constitute a major part of the work. Mr. Robinson has been in the business for forty-seven years. It is a tradition that the pharmacy is passed on to employees: only once has it come on to the market since its foundation.

The distinction of having been under the proprietorship of only two pharmacists—father and son—since 1879 is enjoyed by the business of G. Taylor & Son, 103 Poole Road, Westbourne. An unusual constructional feature is that in 1885 the premises were enlarged by taking forward the frontage by about the same depth as the existing pharmacy. At a later stage the Council would have liked that frontage for road widening. The present shopfront dates



ACROSS TOP
Bilson & Friendship, Ltd., Lansdowne Crescent; Rose & Hornby (Savory & Moore, Ltd.), 509 Christchurch Road; Gordon & Boyle, Ltd., 455 Christchurch Road; G. Taylor & Son, Poole Road.

LEFT-HAND COLUMN THIS PAGE
Interior and exterior of Williamson & Treadgold, Ltd., The Arcade.

RIGHT-HAND
Interior of Boots, Ltd., Christchurch Road, Boscombe.

only to the period between the wars, but a fine array of specie jars and a full complement of shop rounds preserve the traditional character of the interior.

A link with Bournemouth's pharmaceutical past was broken when the late Mr. Francis Rose died in 1957, but his name lives on in the title Rose & Hornby on the facia of a pharmacy at 509 Christchurch Road, Boscombe. The business, bought by Savory & Moore, Ltd., about twenty years ago, is managed by Mr. G. E. Hilton, M.P.S. The famous and well-established business now includes surgical, acoustic and electro-medical departments.

A Famous " Customer "

Another of Bournemouth's corner-site pharmacies is that of Gordon & Boyle, Ltd., 455 Christchurch Road, Boscombe, founded in 1906 and conducted now by Mr. K. R. Boyle, a son of the one whose name appears in the title. Mr. Boyle numbers among his most valued customers the Strathallan nursing home supported by the Nuffield organisation.

When the premises occupied by J. K. Matterson, Ltd., chemists, 12 The Arcade, were disposed of seven years ago and converted into a gown shop, the goodwill and prescription books were acquired by Williamson & Treadgold, Ltd., a prominent Bournemouth company chiefly in the food trade, who opened a pharmacy in the Arcade. Commissioned to design the new premises was Mr. Ronald Sims, the young architect best known, perhaps, for the Punshon Memorial church to which reference has already been made. The result is a compact shop whose contemporary style is reflected alike in facia and fittings. Besides a well-stocked photographic department and skilfully planned dispensary the shop accommodates a ladies' hairdressing salon on the first floor and a gentlemen's salon below, both reached through the shop.

A Mammoth Drug Department

On April 11, 1957, the manager of the Boscombe branch of Boots, Ltd. (Mr. R. H. Young, M.P.S.), was given the promotion of taking over the immense new premises, 200 yds. along the street from the shop he had managed and which had done duty for about half a century, that had been fitted out on the most modern store lines by the company. The total floor area is 6,500 sq. ft., of which about two-thirds is given over to the chemist department, the remainder being taken up with gift departments reaching back to a rear entrance on Haviland Road.

The drug counter is 45 ft. long, and the staff of the chemist department includes three pharmacists and two apprentices. Five male assistants have served apprenticeships; three young lady assistants have not. The department does a large dispensing business, of which 15 per cent. is still private.

Above are a canteen, cash room, chain of spacious stockrooms, space for handling goods (with pallets and fork-lift truck, etc.), all contributing to promote the mass sales for which the premises have so purposefully been planned.

In the title Bilson & Friendship on the facia of the pharmacy at Lansdowne Crescent, pharmacists who know the history of their Society will recognise the name of a former president: Mr. F. E. Bilson, whose high standards of professional practice are well maintained under Mr. R. W. H. Cutler, M.P.S. Four massive carboys dominate the display window of the pharmacy, each illuminated at night by a flambeau. Early in the spring work was started on enlarging the shop by adding a new room on an unused part of the garden at the rear of the shop. The addition accommodates the dispensary, and Conference visitors will almost certainly be able to see in the completed work a modernisation that manages to preserve the best features of the pharmacy as it was under Mr. Bilson.

Hospital Pharmacy in Bournemouth

The main hospital pharmacy in the area is at Boscombe's Royal Victoria Hospital. Its chief pharmacist, Mr. Dennis F. Smith, is also Conference local secretary. He directly superintends the pharmaceutical services of the hospital itself, of its branches at Westbourne and Gloucester Road—totalling 506 beds—and of a dozen other institutions—totalling well over 600 additional beds—scattered over a radius of about twenty miles. In addition he has to cope with one of the busiest out-patient departments on the South Coast, at which an average of more than 600 out-patient prescriptions are dispensed each week. To assist him he has a deputy chief pharmacist, four pharmacists and two assistants-in-dispensing, one of the pharmacists serving part-time at Royal Victoria Hospital, Westbourne.

The voluminous and complicated work involved in carrying out his responsibilities in the Group has to be dealt with by Mr. Smith in a pharmacy and ancillary accommodation that are hopelessly inadequate in size and depressingly out of date in layout, and the pharmaceutical staff are to be congratulated on managing somehow to keep on top of the work in view of the congested conditions in the department. Minor improvements have been made in recent years. For example, a vertical iron ladder by which supplies were once brought up from basement stores has been removed and a new working bench fitted where it entered the pharmacy. Stores have been moved so that galenicals no longer have to be kept in a room where, in the presence of steam pipes, the temperature never falls below tropical level. Major improvements, however, have hitherto been prevented by lack of space, and it is satisfactory to know that work is about to start on the conversion of the former pathological laboratories into a pharmaceutical department. It will certainly then be more spacious and could, with good planning and adequate financial provision, be excellent.

Poole General Hospital (320 beds), also in the Bournemouth and East Dorset Group, has its own chief pharmacist (Mr. V. E. Benjafield), who also looks after the requirements of Alderney Hospital (sixty beds) with the aid of another pharmacist and an assistant-in-dispensing. There, too, the pharmacy is grossly inadequate and it is to be hoped that proper provision is being made for the department in the plans for the new hospital—work on which has already started—that will replace the present hospital.

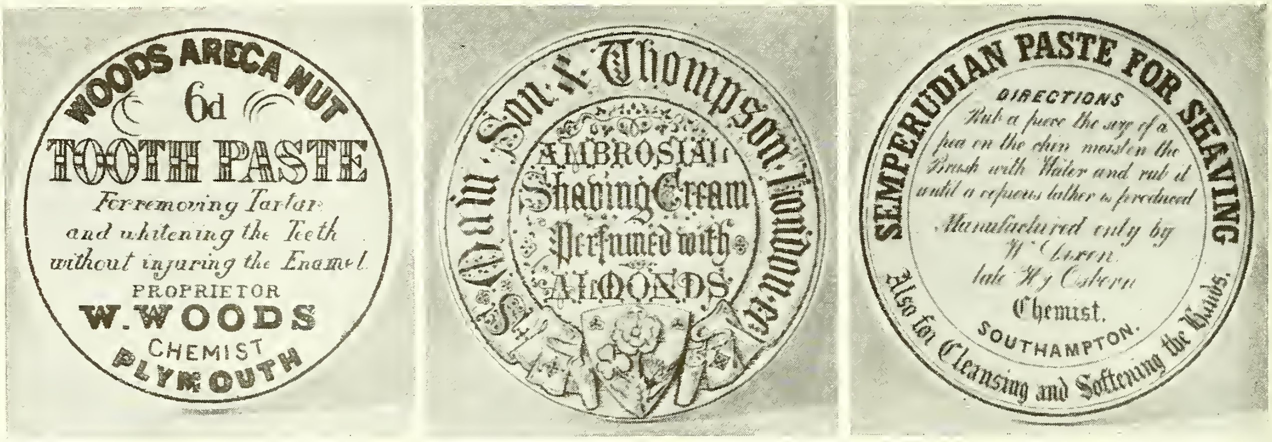
A new pharmacy was opened in December 1958 at Christchurch Hospital (334 beds), a former public-assistance institution which is being converted into a general hospital. There Mr. A. J. Tawn (formerly deputy chief pharmacist at Boscombe) is in charge of a well-equipped department that is large enough to meet future needs of the hospital.

A Local Wholesaler

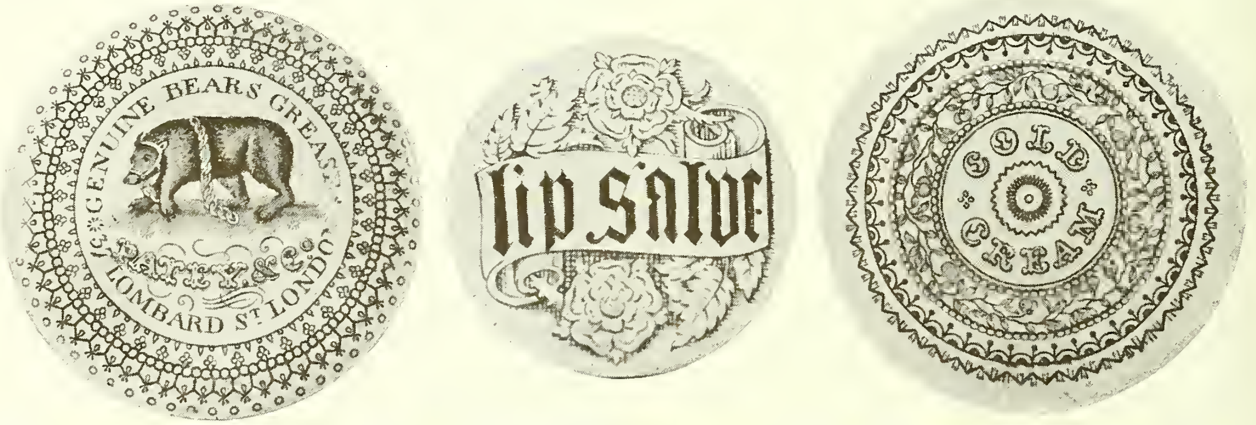
Most chemists in the area of the Bournemouth Branch of the Pharmaceutical Society, especially in the direction of Weymouth and Dorchester, plus many on the Isle of Wight and a number in the area of the Southampton Branch, rely principally for their supplies on the Chemists Supply Co., Ltd., Boscombe Grove Road, Boscombe. Conference visitors who may find themselves in the area of the company's handsome modern warehouse may identify it readily by its aerial mast, which may be taken as symbolic of the company's determination to provide a fully up-to-date service. The mast was erected in the first place to take radioed orders from Isle of Wight chemists and, though transmission conditions are not always to be relied upon, the system is still in use, even occasionally from vans on the Bournemouth town delivery. Other modern methods in use by the company are an Ipsophone that accepts orders at any time throughout the twenty-four hours and a telephone call for orders once or twice a day (with deliveries to correspond). Speed and efficiency of handling orders were the prime considerations in the planning of the building, which has been in existence for only three years. Goods on shelves in banks coming forward from the side walls of the main stockroom are put by girls into open fibreboard creels that pass, on a U-shaped conveyor, up the length of the room and back again. At the end of its journey the creel is put into an open-backed rack from whose other side it is withdrawn and put into its van by the appropriate deliveryman. The depôt has a fleet of nine vans and a staff complement of between fifty and sixty. There is a showroom at which chemists may call and see new goods before ordering, and a two-compartment strongroom accommodates a good stock of cameras and other relatively expensive photographic apparatus. The company is a member of the Sangers group.

COMMONPLACES OF YESTERDAY

COLLECTORS' PIECES OF TODAY


WOODS ARECA NUT
6d
TOOTH PASTE
For removing Tartar and whitening the Teeth without injuring the Enamel
PROPRIETOR
W. WOODS
CHEMIST
PLYMOUTH
S. Maw, Son & Thompson, London, E.C.
AMBROSIAL Shaving Cream Perfumed with ALMONDS
SEMPERUDIAN PASTE FOR SHAVING
DIRECTIONS
Rub a piece the size of a pea on the chin moisten the Brush with Water and rub it until a copious lather is produced
Manufactured only by
Chemist.
SOUTHAMPTON.
Also for Cleansing and Softening the Hands.

Pot lids of glazed earthenware. Too expensive to withstand the competition of modern methods and modes in containers, the jars had the great merits of being inert towards their contents and of presenting scope for decorative and of course permanent labels. Without them it would have been difficult to market attractively such products as the early tooth-paste and shaving creams here represented.



Bear's grease, lip salve and cold cream, all either obsolete or obsolescent products — at least in their original formulations — were cosmetic preparations for which jars of earthenware were obvious containers of choice.

SENNA TODAY

Modern commerce in a drug that has had its ups and downs of demand

IN common with many other drugs of vegetable origin, senna has today a usage by the pharmaceutical industry that is much less than in former days. None the less, the commodity remains one of the major imports in the botanical drug field, the greater part of the material imported being used in manufactured preparations. About 20–30 tons of hand-picked Alexandrian senna pods and 10–15 tons of hand-picked Tinnevelly senna pods are handled on the London market annually, solely for resale for infusion purposes. In addition there are smaller quantities of large, top-quality Tinnevelly senna leaves utilised for the same purpose, but those leaves, after re-packing, would most likely be exported overseas, where they are more popular than in Britain.

Whilst Alexandrian (*Cassia acutifolia, Delile*) and Tinnevelly (*Cassia angustifolia, Vahl*) sennas are both official, the current trend is for manufacturers to use the Tinnevelly variety of leaves and pods. The chief reasons for this would appear to be generally cheaper prices; greater reliability of supplies; and freedom from weevil infestation. In addition the original packages are easier to handle and store, the material being imported in solid bales, weighing about 400 lb. each, the senna being packed under considerable pressure. It can be appreciated that that type of packing is excellent for the commodity as the bulk of the contents are well protected from damage in transit. Also the senna itself remains well preserved through the occlusion of light, etc.; in fact a small quantity of manufacturing leaves originally imported in 1933, and finally processed in 1955, were found upon opening to be better in appearance than the current crop shipments, though the colour had become yellowish.

Up to recently Alexandrian material being more brittle than the Tinnevelly, has not been compressed before shipping. However, though few United Kingdom importers may have seen them, a number of manufacturing-grade pods in press-packed bales of about 190 lb. were recently delivered to the London market and found to be in satisfactory condition.

Tinnevelly Senna

Of the Tinnevelly leaves received, the main grade called for in the United Kingdom is the third quality f.a.q. (fair average quality " threes " of commerce)—which, subject to favourable climatic conditions, is a small-to-medium-sized leaf of fair colour and reasonably free from stalk. As mentioned, the superior grades are used in the repacking trade.

There would appear to be no clear line between the manufacturing uses of leaves and pods for, although larger quantities of leaves are imported, there still remains a fair demand for the manufacturing grade of pod, or, as shown commercially, the f.a.q. pod.

It should be borne in mind that importers have to be sure they are importing from really reliable shippers, as from time to time shipments arrive showing signs of adulteration, in most cases with *Cassia auriculata*. That variety of senna, commonly known as Palthe senna, contains little or no active principle, and shipments of Tinnevelly senna have been reported as being adulterated with it in 1919, 1948, 1952 and 1955. Subsequently there have been other instances, but they have been traced to several " mushroom " shippers who have quickly disappeared from the senna market. Needless to say, if a substandard leaf is genuinely required, it can be bought at a *pro-rata* discount, though stocks are unlikely to be held in London.

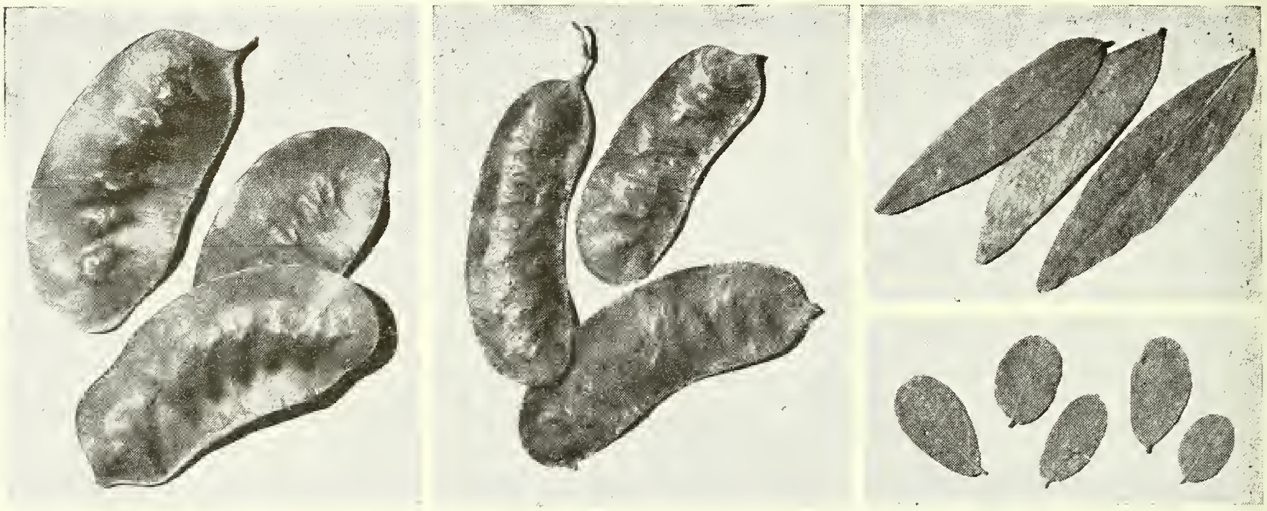
The " Wet " Crop

The main, or " wet " crop as it is commercially known, usually becomes available for shipment from Tuticorin during June-July, immediately after the monsoon rains. First available are the lower grades of leaves and pods, the better qualities not being dispatched until August. Unless the crop has been a late one, senna shipped after October-November has usually been in store under rather adverse climatic conditions, and the quality tends to be somewhat lower than that of the earlier shipments.

There is also a smaller crop, known as the " dry " crop, which is usually gathered about February-March, but importers and manufacturers in the United Kingdom prefer not to handle that material if they can avoid doing so. However, it should be mentioned that, whilst the dry crop is invariably of poorer appearance than the wet, the active ingredients may not be much different; research which is in hand at the present time on that subject seems to bear out that assumption.

The local Communist government elected in the senna-growing areas of Southern India a year or so ago affected the prices asked for the commodity to a slight extent, higher wages being demanded and received by the ryots (collectors). That development adds support to the view that prices currently prevailing are unlikely to depreciate to any marked extent so long as the general level of world consumption remains fairly stable.

C. angustifolia senna is a small shrub which grows to a height of 2–3 ft. in the Tinnevelly and Ramad districts of Southern India. It also grows wild in the hilly areas of Madura and Trichinopoly districts. On dry lands it is cultivated along with cotton and oil seeds from November, while on wet lands the season is from April and often forms an



The physical characteristics of the Alexandra senna pods (left) and the Tinnevelly variety (centre) are quite distinctive. Top right, Tinnevelly leaves and below their chief adulterant, Cassia auriculata.

alternating crop with rice. The " dry " plant lasts about a year and the " wet " plant only six months.

As the seed has a hard coat it is first pounded with sand to induce quicker germination. It is sown either by broadcasting or by " dribbling " at the rate of 15 lb. per acre. Plants require plenty of sunshine and occasional drizzle Heavy rain injures the roots.

Collection of Leaves

Leaves are picked from the plant after two months, the prime qualities being obtained from the " wet " crops during the period from late May to July. The second picking gives prime twos and threes. To induce lateral branching, the first flush of flower stalks is cut off. When the leaves are fully grown and thick and bluish, they are stripped off by hand, and a second stripping is made after one month. Thereafter the plants are allowed to bear flowers and set seeds.

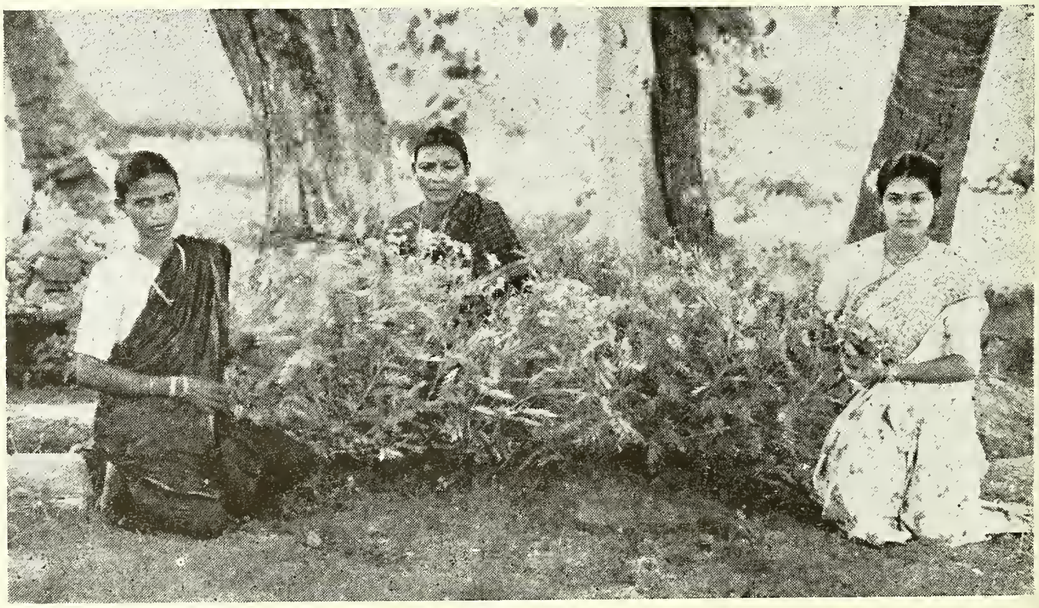
Exports of Tinnevelly Pods and Leaves

	Cwt.	Rupees
1958 January-October ...	45,499	1,933,196
1957 year ...	13,822	554.408
1949–50 " ...	36,349	949,346
1948–49 " ...	24,657	587,832
1947–48 " ...	32,856	1,012.832
1946–47 " ...	47,962	1,973,350
1945–46 " ...	25,499	729.672
1940–44 average ...	48,748	626,135
1935–39 " ...	59,356	835,710

The leaves are dried under trees or in well ventilated sheds in the growing area, the time taken for the process being three or four days. They are transported to the collecting centres at Tuticorin, where they are graded and put through a machine to remove dust, sticks and the smallest leaves. They are then packed under pressure into bales ready for export.

Harvesting of Pods

The pods are gathered after three or four months, by which time they have attained a green colour. They are taken from the plants in grape-like bunches and hung up in ventilated sheds to dry (strong sunlight spoils the colour). They are then picked over several times and receive their final sorting in the Tuticorin factories, of which there are about twelve, all utilising women, for the work calls for excessive patience.



Picking the leaves from Tinnevelly plants (C. Angustifolia) which grow to a height of 2-3 ft. The shrub is cultivated in certain districts of South India and also grows wild in some hilly areas.

The dry land crop yields about 300 lb. of dried leaf and 75 to 150 lb. of pods per acre; the yield from the wet land crop is 750 to 1,250 lb. of leaf and 150 lb. of pods. (*Wealth of India, Raw Materials,* 1950. **II,** 94.) Almost all the senna produced in India is exported. Germany has once again become the largest purchaser of senna from India, a position she held prior to the 1939-45 war.

Alexandrian Senna

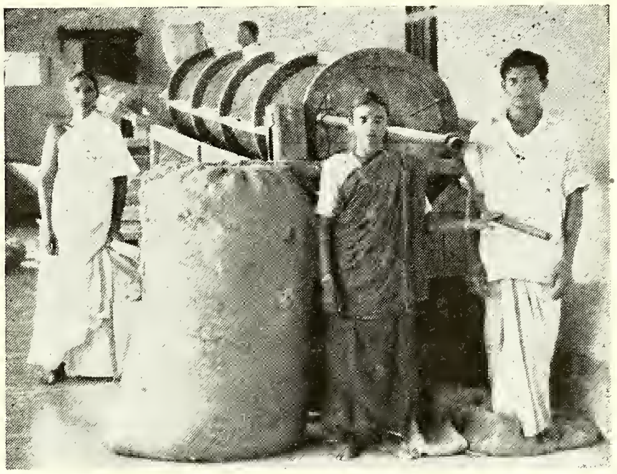
Alexandrian senna, so named from the original port of shipment Alexandria, but now shipped from Port Sudan, is of primary interest only for the hand-picked pods for repacking, with a specialised demand for the manufacturing grade of pod. Until about five years ago there was also a fair interest in the broken leaves and siftings for manufacturing purposes, but those grades have virtually been replaced by the Tinnevelly variety, and only comparatively small quantities are now imported into the United Kingdom.

Shipments start during the latter part of March and April, although the senna is actually packed and ready during February or occasionally even January. However, because of the coincidence of the cotton and gum acacia crops, both of which form a very considerable portion of the Sudanese economy, combined with poor rail facilities from the hinterland to Port Sudan, it is quite normal for a delay of four to six weeks to occur before shipment is effected. The quality of the senna will usually be maintained up to about the end of August, at the latest, but thereafter it will tend to depreciate, and the presence of the Indian rice weevil, to which Alexandrian senna is particularly prone, can often be detected. That form of infestation can be killed by fumigation and the sifting of the cocoons out of the bulk, but the characteristic pinholes in the pods remain.

During the Suez Canal dispute of 1956–57, supplies of Alexandrian senna to the London market were seriously disrupted for a time but merchants' stocks were sufficient to satisfy wholesalers and manufacturers, though the qualities of the material available were not always as good as might have been wished.

ALEXANDRIAN SENNA EXPORTS FROM SUDAN

Destination	Year 1957	Jan.-Nov. 1958	Year 1957	Jan.-Nov. 1958
	Tons	Tons	£ sterling	£ sterling
United Kingdom ...	211	103	32,651	20,150
Western Germany	54	92	4,779	10,098
United States ...	112	174	5,890	12,233
Other countries ...	12	13	936	1,043
Total	389	382	44,256	43,524



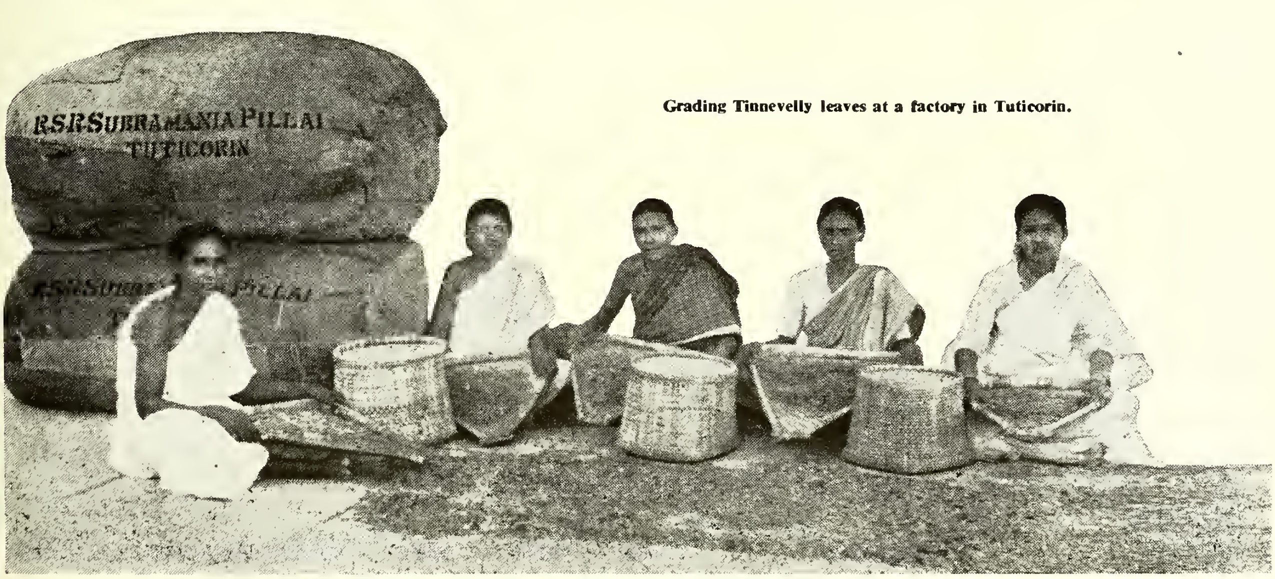
Leaves are put through winnowing machines as seen above to remove dust, sticks and the smallest leaves.

Whilst Arabian senna has been mentioned from time to time in the history of the commodity it is many years since it has been heard of commercially, but in 1957 a small trial shipment of leaves was made from Aden, described as Aden senna. The material was comparable to the Arabian "Mecca" senna, the leaves having the main characteristics of low-grade *C. angustifolia,* but being more brittle and containing an excessive amount of stalk. Shippers were advised that the material was unlikely to be merchantable, and samples were then produced of a good-quality selected leaf. The prices asked, however, were uneconomic and since then no more has been heard of the material.

Demand from Continent

After the 1939–45 war London lost a large proportion of its entrepôt trade in senna, mainly to Hamburg. The situation has been further aggravated by many Continental countries, now undertaking direct buying from India and the Sudan. Unfortunately those two factors represent a considerable loss of trade to the United Kingdom, as the Continental demand for senna, in particular for manufacturing purposes, is much greater than that for home consumption.

At one time the bulk of senna was consigned to various brokers in Mincing Lane for sale by public auction. Buyers were able to make their valuations on dock samples drawn from the goods on arrival and displayed at the



Grading Tinnevelly leaves at a factory in Tuticorin.

Drawing a sample of Tinnevelly leaves in a London warehouse. The leaves are so tightly packed that a hammer and iron chisel have to be employed to loosen the bale sufficiently to draw a sample. Right: A merchant examining a new consignment on arrival at the warehouse.

brokers' salerooms before the auction. London was then the chief market for covering the world's requirements and much spirited bidding was often witnessed at the auctions.

United Kingdom trade at present is chiefly confined to a few London merchants who specialise in senna, none is now sent on consignment because of the risk of heavy warehousing charges on unsold goods. The greater part of London importations represent actual deliveries against forward purchases.

It is extremely difficult to assess the future prospects of the commodity for, whilst certain sections of the pharmaceutical trade have been firm in their conviction that senna is a "dying" drug, there seems no reason why it should not take on a new lease of life now that it is possible to prepare a standardised form of it. In the past it has been a criticism of senna that carefully regulated doses did not always provide regular results.

AVERAGE PRICES OF SENNA LEAVES AND PODS 1939–59

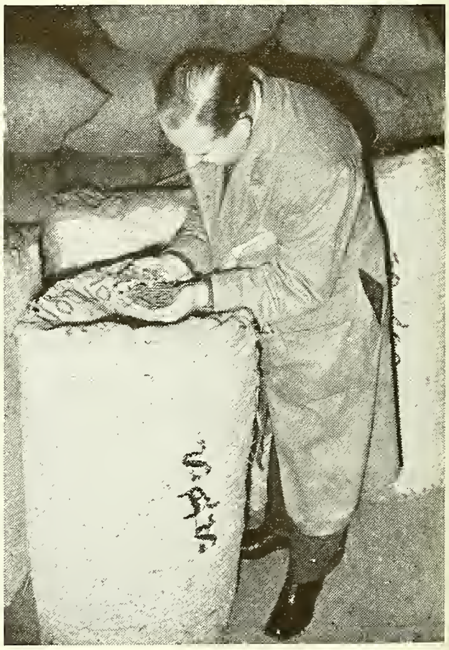
Tinnevelly f.a.q. No. 3 (per lb.)		Alexandria hand-picked pods
1939 (July)	2¾d.	4s.
1945 ,, ...	6d.	4s.
1953 ,, ...	9d.	3s. to 4s. 6d.
1955 ,, ...	7d.	8s.
1956 ,, ...	7d.	4s. 6d. to 6s. 9d.
1957 ,, ...	10d.	4s. 6d. to 6s. 6d.
1958 ,, ...	10d.	5s. to 6s.
1959 ,, ...	10d.	4s. to 6s. 6d.

Active Constituents

During the last decade considerable research has been undertaken in Britain into the active constituents of senna and while some of the answers are known some problems are still unsolved. Browne, Edwards, Fairbairn and Reid (*Brit. med. J.*, 1957. **1**. 436) found that gross disparities—laboratory and clinical—existed between various batches of B.P. senna syrup. They also stated that the chemical assay confirmed previous indications of deterioration in aqueous B.P. preparations. In 1951 Fairbairn and Saleh (*J. Pharm. Pharmacol.*, **3**. 918) showed that from 60–70 per cent. of the biological activity of both senna pod and leaf could be accounted for by the content of sennosides A and B and a third non-rhein anthracene glycoside. The remaining 30–40 per cent. of activity was due to an unknown factor. Subsequently (*ibid.*, **5**. 317) they found that the factor could be extracted from the crude drug along with the anthracene glycosides by hot water and by 70 per cent. ethanol, but none of it survived when an aqueous solution was concentrated by prolonged evaporation in accordance with the directions given in the B.P. 1953. Those and other findings no doubt influenced compilers of the 1958 Pharmacopœia to drop both the liquid extract and syrup of senna though the fruit and leaf remain official. Fairbairn, Friedmann and Ryan (*ibid.*, 1958. **10**. 186T) have now shown that the sennosides are themselves breakdown products of primary glycosides, one of which has been isolated and shown to be about half as active again as the sennosides. The presence of these primary glycosides in the crude drug may well be the unknown factor referred to.

The first-mentioned authors (Browne and others) in their report found that a dry granular preparation of senna pod proved to be chemically stable for long periods and clinically satisfactory, a result subsequently confirmed by others. The concentrate used in the granular preparation is biologically standardised and conserves the total laxative principles of the pod. It is stated to be the most widely prescribed stimulant laxative under the National Health Service. A British product, it has also been generally accepted in America.

With a stabilised form of senna available to replace part if not all of the lost market for home-infusion pods (and there are still many advocates for that method of medication) together with several old-established proprietary medicines based largely on senna, the commodity appears still to have a substantial future.



ALEXANDRIAN PODS: A sample of Alexandrian pods being drawn from a consignment at the London Docks. Unlike the Indian variety the Alexandrian pods are packed loosely into bales made of matting.

Grateful acknowledgement is made to S. A. Shepherd & Co., Ltd., for their assistance in the compilation of this article.

TRUSTS

for research, welfare and education

How and why they emerged; how they differ; and what they have achieved

"FOUNDATIONS are still to the general public mysterious and remote organisations," says the eleventh report (1955-56) of the Nuffield Foundation. One authority describes such foundations as acting "as a kind of third estate between the State and voluntary agencies." Put another way, they might be described as institutions engendered by modern industrial organisation out of existing conceptions of charity, assisted by taxation reliefs.

From earliest times there has been a sense of mutual obligation within a group, even among primitive peoples, and the growth of philanthropy has continued with the growth of civilisation.

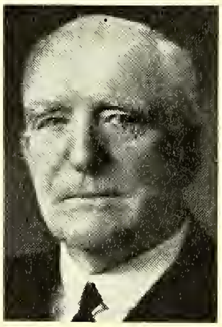
During the Middle Ages charity was often the means whereby the benefactor sought future salvation, and was thus primarily selfish in motive. The mediæval church never succeeded in giving effect to its ideal of an all-enveloping Christian charity, and the Reformation put an end to any hope that universality would be achieved.

In England in 1601 was passed a Statute of Charitable Uses, as a result of which, and especially during the eighteenth and nineteenth centuries, great numbers of charities were formed. By that time the emphasis had changed. The idea was now to reform the character of the recipient, poverty being considered the result of idleness.

The beginning of the twentieth century, of course, saw the expansion of applied science, and gradually the present-day statutory-voluntary partnership evolved, energised by the philanthropic motive. The number of charitable trusts in this country today is not accurately known, though it is generally agreed that it is greater than 110,000. Of those, 30,000 are educational. The classification of the remaining 80,000 is unknown, but it is believed that over half of them refer to the sick or poor in one form or other. They range from small local bequests, sometimes yielding only a few shillings a year, to the national trusts that often have huge sums at their disposal. There has always been an emphasis on the sick, and it is therefore appropriate that a number of charities should be linked with the pharmaceutical industry.

THE WELLCOME TRUST

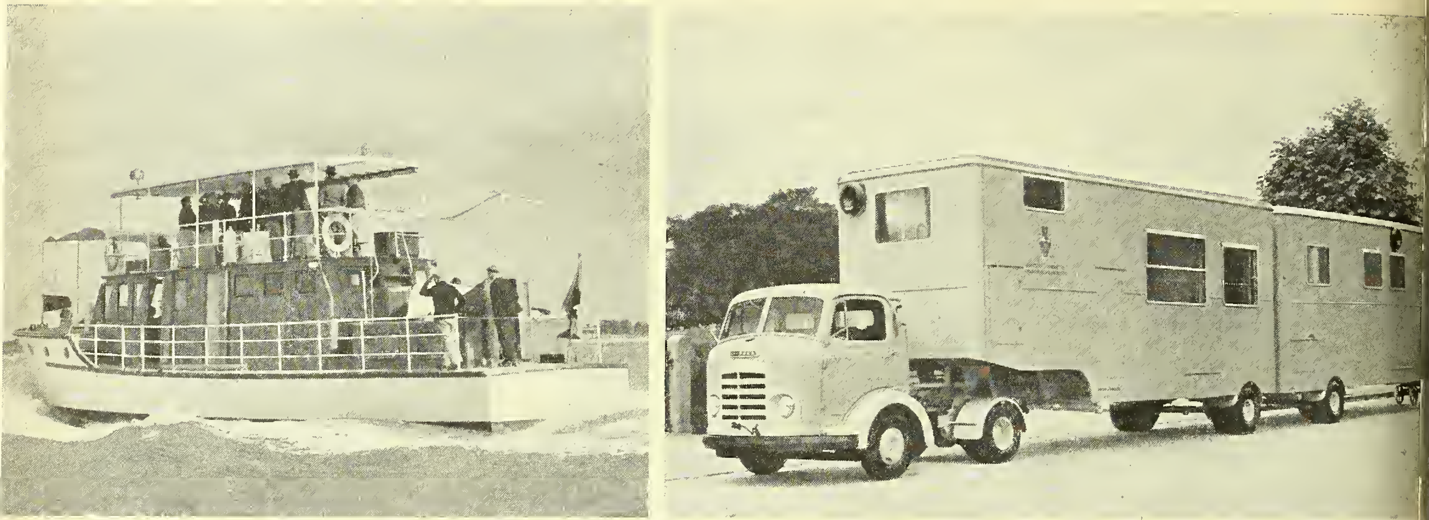
Of trusts with pharmaceutical links probably the best known is the Wellcome Trust, which derives its income from the activities of the Wellcome Foundation, Ltd., trading under the name Burroughs Wellcome & Co. The Trust was founded in 1936 under the will of the late Sir Henry S. Wellcome, which vested all the shares of the Wellcome Foundation, Ltd., in five trustees, who thus have available all the distributed profits to carry out the purposes of the Trust. Those objects, briefly stated, are to support research in medical and veterinary science and in the sciences contributing thereto. The trustees are also empowered to establish or endow research museums and libraries.


Sir Henry Wellcome

Sir Henry's use of the word "foundation" in the title of his commercial assets has given rise on occasion to some misunderstandings, for the Wellcome Foundation, Ltd., is a private company with a present-day capital of £3 millions and is not truly a Foundation. Readers will recall that recently the company purchased the majority of the shares of Cooper, McDougall & Robertson, Ltd. (see *C. & D.*, June 13, p. 630).

One understanding of the term "foundation" is of a non-profit-making legal entity which has its own principal fund or receives contributions from certain sources; is governed by its own trustees or directors; and has been established to serve the welfare of mankind. On that basis the term foundation would have been more appropriate if it had been applied to the Wellcome Trust, which is the recognised charitable body. Since its establishment the Wellcome Trust has allocated more than £2,500,000 in carrying out the objects for which it was founded.

A unique aspect of the Wellcome organisation is that the limited company carries out its own research programme in connection with the medical and veterinary products sold by the many distributing organisations throughout the world which trade under the title—or some variant of it—of the original partnership: Burroughs Wellcome & Co. The Wellcome Trust, after receiving the dividends from the activities of the commercial company, also supports research generally in a wider sphere. During 1957 the Wellcome trustees published their "first report" (see *C. & D.*, May 25, 1957, p. 559). In it they stated that the Wellcome trustees and the directors of the Carlsberg Foundation in Denmark had decided to institute Carlsberg-Wellcome Research fellowships with the object of encouraging friendly co-operation between Danish and British research workers.



The motor cruiser " Lady Dale" presented by the Welcome Trust to the Medical Research Council for service on the river Gambia, and the mobile laboratory and x-ray unit given to Manchester University.

THE CARLSBERG FOUNDATION

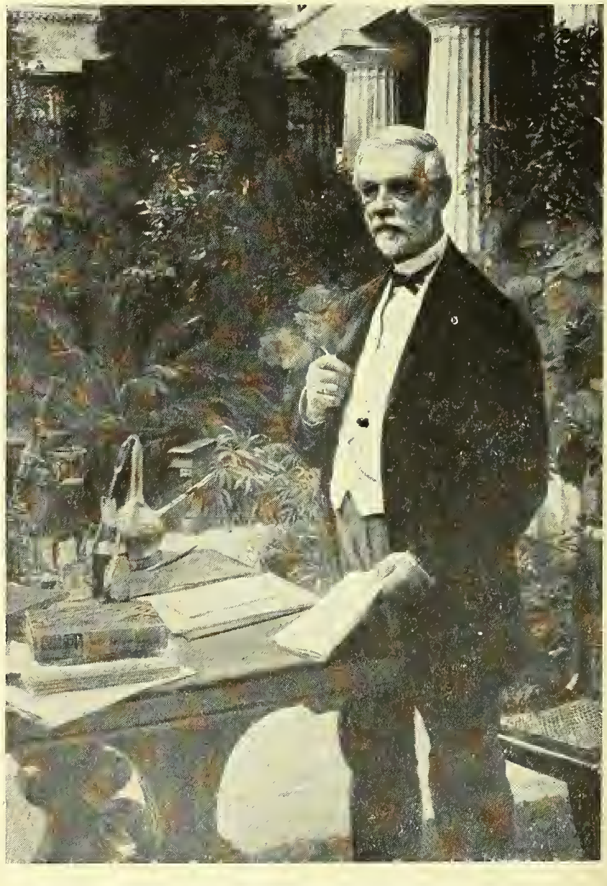
When he devised the Wellcome Foundation, Ltd., Sir Henry Wellcome was thought to have had the (Danish) Carlsberg Foundation in mind. The Carlsberg institution is based on what might, with not too much exaggeration, be described as a specialised pharmaceutical process: brewing. Its story begins with a certain Christen Jacobsen, whose parents were farmers in Jutland, but who went to Copenhagen when he was a young man. Soon afterwards he was operating his own brewery in Brolaeggerstraede, where he taught the art of brewing to his son Jacob Christian Jacobsen.

The son developed into a skilful brewer, and was specially noteworthy for being always ready to apply the results of the latest scientific research to improve the beer of his day. As a result of his investigations and travels abroad he developed a process of " bottom fermentation," producing a Bavarian or lager beer, and in 1847 built a new brewery, which he named Carlsberg after his five-year-old son Carl and the hill (berg) on which it was built. With it, in effect, he converted the brewer's craft in Denmark into an industry. Yet J. C. Jacobsen could never have imagined the tremendous expansion that was to take place in the brewing industry. Quite the reverse, for his view was that the quality of the beer would suffer if his establishment became too large. He did, however, ensure that old and uncertain methods were replaced by new ones having a scientific basis. In 1871 he built and equipped the Carlsberg Laboratory, whose chemistry department was under the charge of Professor J. Kjeldahl. Before joining the Carlsberg Laboratories, Kjeldahl had studied in the University and Polytechnic Institute, Copenhagen, and been an assistant at the Danish Agricultural University. In his new situation he studied plant physiology and biochemistry, including enzymatic reactions, and about 1881 devised the famous method of nitrogen analysis that bears his name.

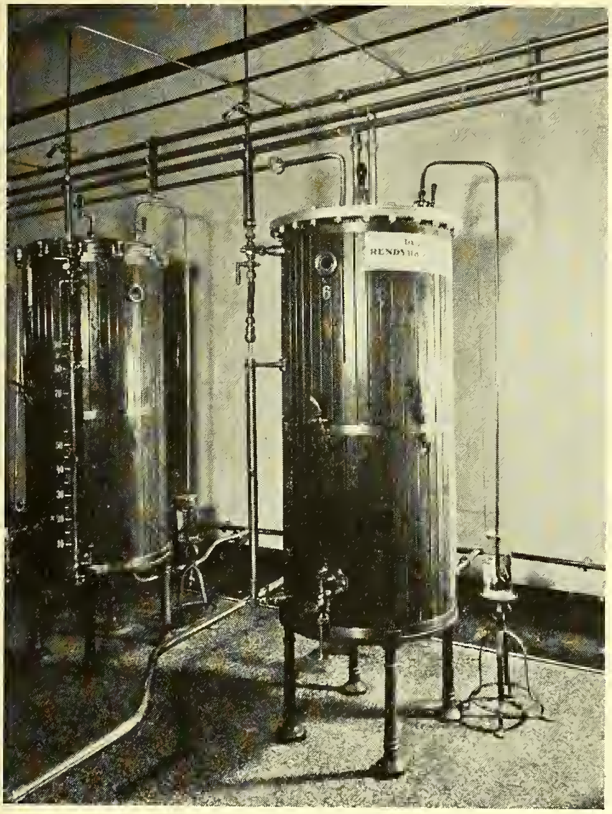
Another famous piece of research work developed in the Carlsberg Laboratory was Professor Emil Chr. Hansen's method for the pure cultivation of yeast. Perhaps even better known to pharmacists is the work of Professor S. P. L. Sorensen who, in his *Etudes Enzymatiques,* II, demonstrated the use of the " hydrogen-ion exponent " and introduced the term *p*H.

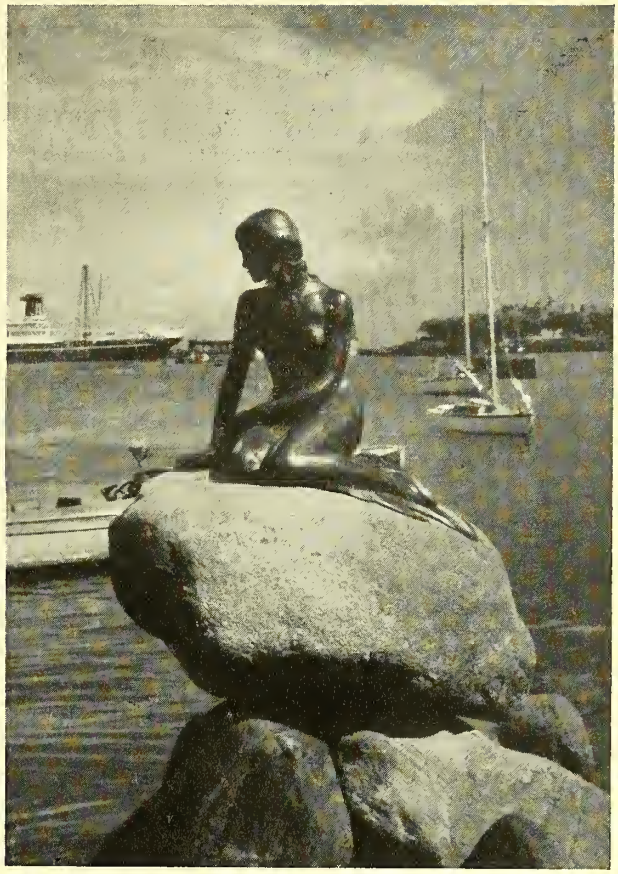
When setting down the principles on which the laboratory has to be run, Jacobsen decided that " no result of the activities of the institution whether of a theoretical or practical nature shall be kept a secret." Fully appreciating the share of science in his success at Carlsberg, in 1876 he set up the Carlsberg Foundation, and on his death in 1887 bequeathed the Carlsberg Brewery to the Foundation to provide a solid basis for its activities. The Foundation is managed by five professors chosen by, and from the members of, the Royal Danish Academy of Science.

Jacob Christian's son, Carl Jacobsen, was also a brewer, but he disagreed with his father on many points, including the father's belief that large-scale brewing would be " deleterious to the industry." The son started a new brewery alongside his father's establishment, and for some years they were keen rivals.



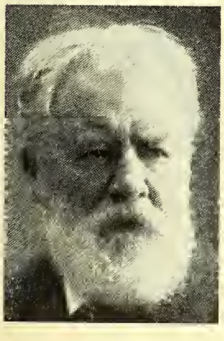
J. C. Jacobsen, founder of the Carlsberg organisation.





First unit, still in operation for cultivating pure yeast. At right: "The Little Mermaid," Copenhagen harbour, presented to the city by Carl Jacobsen. It will be seen by pharmacists attending the International Pharmaceutical Federation Congress in 1960.

Possessing many of the attributes of his father, Carl Jacobsen developed a special interest in art, and in 1902 established the Ny (New) Carlsberg Foundation, its purpose the promotion of art. The Foundation also maintained the Ny Carlsberg Glypothek which, with its collection of old and modern paintings, sculpture and archæological treasures, is today one of the finest museums of its kind. On his father's model Carl Jacobsen conveyed his brewery Ny Carlsberg to that Foundation and in 1906, when the two brewing establishments were amalgamated under the name Carlsberg Breweries, the profits from the great combined enterprise became for all time devoted to cultural purposes.



Carl Jacobsen

To quote from the Book of Carlsberg, from which much of this information has been derived: "Although Carlsberg is first and foremost a national institution [but definitely not a nationalised one] . . . It is of the greatest international importance, too. In so far as science and art are themselves international . . . the results of the work . . . of the Carlsberg Foundation . . . will necessarily carry their effect throughout the world."

An outcome of the collaboration of two great foundations was the Carlsberg Foundation's Institute of Biology founded in 1932, which has become well known for its contributions to science. The Rockefeller Foundation had offered 1 million kroner, the interest to be used for running a cytological institute in whatever country would defray the cost of building and equipment. Besides undertaking that task, the Carlsberg Foundation has provided additional annual grants.

THE CIBA FOUNDATION

In the year 1947 the Swiss chemical concern **CIBA** of Basle established, for the promotion of international co-operation in medical and chemical research, the Ciba Foundation. That organisation was created to bring together scientific workers from all countries and continents so as to help cut out the wastage of time and skill caused by the duplication of effort in the various countries.

For three reasons the Foundation was located in England. The first was that England was considered a convenient meeting-place for persons from the Continent and from America. The second was that English had become one of the principal international languages of science. Thirdly it was considered that an organisation of the kind intended should be, so far as possible, without bias and beyond any national or commercial influence. In England it was possible, moreover, to take advantage of the law on charitable trusts and to obtain certain reliefs from taxation.

Trustees

A trust deed setting up the Foundation for the Promotion of International Co-operation in Medical and Chemical Research was accordingly signed on September 25, 1947, the original trustees being Lords Beveridge, Horden and Uthwatt, Professor Adrian, and Mr. Raymond Needham. They were appointed by the founder company (Ciba, Ltd.), held their appointments for life, and were entirely unpaid.

Subject to the provisions of the deed, and to the authority of the trustees, the work of administration and management of the Ciba Foundation is carried out by an executive council composed of distinguished men who are elected by the trustees and the founder for periods of three years at a time. Although the Foundation was generously endowed by CIBA of Basle in the first instance, and has received financial support ever since, it remains an independent autonomous organisation, formulating its own policy in accordance with the original terms of reference. The Foundation is housed at 41 Portland Place, London, W.1. Its work was formally inaugurated by Sir Henry Dale (who is incidentally the chairman of the Wellcome Trustees).

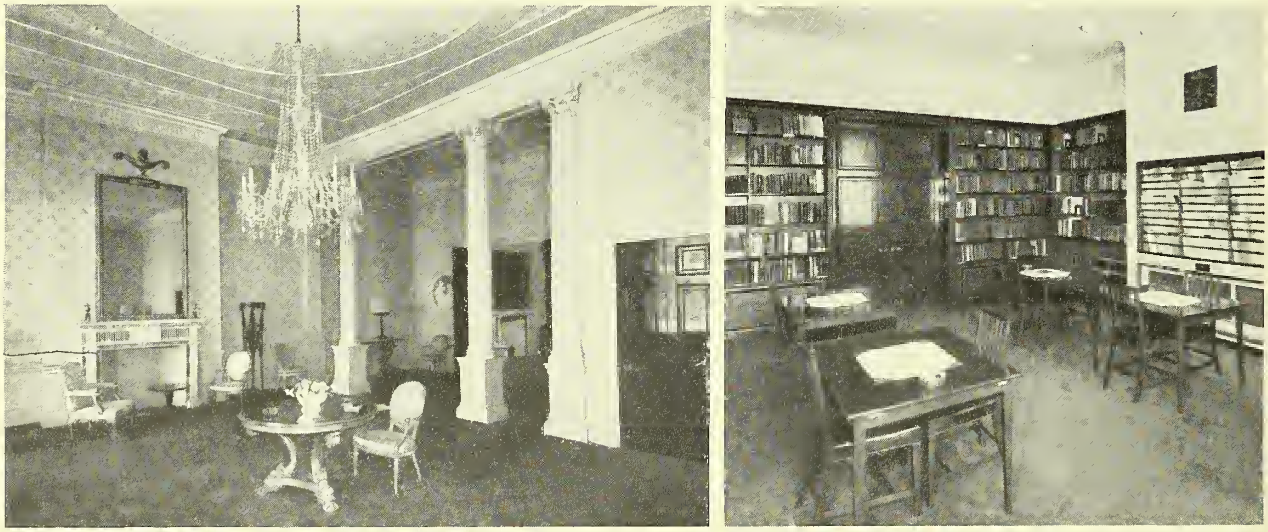
To assist them in carrying out their work the Trustees have formed an advisory panel consisting of distinguished scientists from thirty-four countries. The members from Great Britain are Professor Dunlop, Mr. S. J. Folley, Professor Fraser, Mr. John Freeman, Professors Gaddum, Macdonald, McMichael and Norrish, Mr. A. S. Parkes, Sir Robert Robinson, and Professor Witts.

At the Foundation's centre in Portland Place living accommodation is available for the use of a small number of scientists from overseas whilst visiting London in connection with their work. The trust deed requires the trustees "to procure the delivery of lectures and holding of conferences meetings and discussions . . ." and each year the Foundation organises five or six international conferences on specialist aspects of basic research in medicine or chemistry.

Annual Lecture

A special lecture is arranged each year. In 1957 it was given before an invited audience by Professor K. U. Linderstrom-Lang, of the Carlsberg Laboratory, Copenhagen, his subject "The Study of Proteins in Aqueous Solution." Besides organising one-day study groups, the Ciba Foundation and the Institut National d'Hygiene in France have inaugurated an exchange scheme whereby doctors of not less than a year's standing, who wish to obtain clinical experience or to carry out medical research, may visit France or England for periods of between two and four months. In that and other ways the Foundation endeavours to fulfil the purpose for which it was established but, as stated in one of its publications, "It is, however, not rigid in its methods, which are capable of adaptation to whatever may currently seem the most suitable means for it to accomplish the promotion of international scientific co-operation." During 1958 the Foundation received a grant of armorial bearings from the Earl Marshal. The blazon reads: Sanguine (the colour of life) three regular hexagons on their points (for Chemistry); on a chief dovetailed or, five annulets interlaced sable (for International Co-operation). The crest is a cock, sable, holding a staff of Aesculapius (for Medicine). The supporters are: Dexter, a wyvern, or, langued gules (for the Founder) differenced by a sword of St. Paul, gules (for London); and sinister, a lion rampant, or langued gules (for Britain), differenced by a crozier of Basle, sable (for the Founder). The motto *Consocient Gentes* is freely translated "Let the nations come together."

Coat of arms of the Ciba Foundation.



Reception room and library, Ciba Foundation.

THE CIBA FELLOWSHIP TRUST

Quite apart from the Ciba Foundation, the CIBA group of companies in Great Britain, under the chairmanship of Sir Arthur Vere Harvey, M.P., have set up an entirely separate trust fund known as the Ciba Fellowship Trust to help graduates and undergraduates from the United Kingdom and Eire to continue their scientific studies at Continental centres of learning. It should be stressed that the trust has no connection with that of the Ciba Foundation. The CIBA group in Great Britain comprises CIBA Laboratories, Ltd., Horsham; the Clayton Aniline Co., Ltd., Manchester, 11; CIBA (ARL), Ltd., Duxford, Cambridge; and Ciba Clayton, Ltd., Manchester, 11. The trust was founded because the group felt that the trend in recent years towards study in America had overshadowed the value of contacts with Continental centres; they considered that links with Europe should be encouraged.

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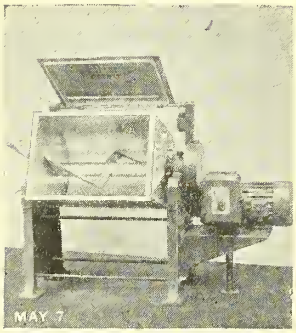

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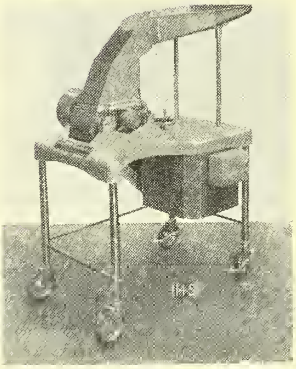

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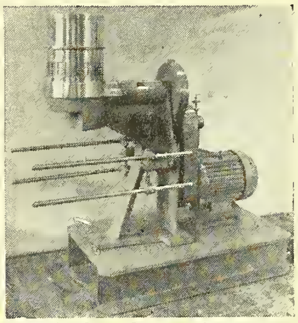

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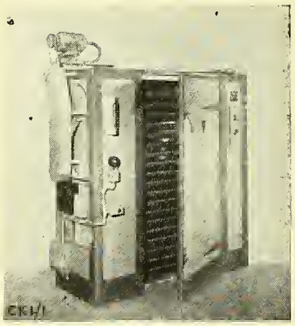

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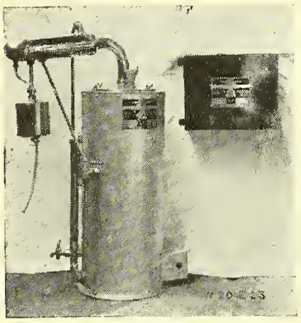

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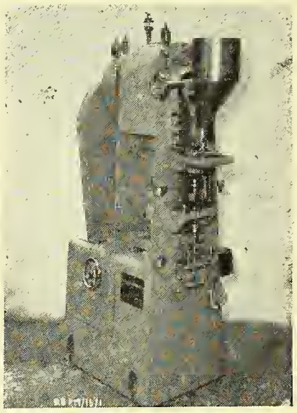

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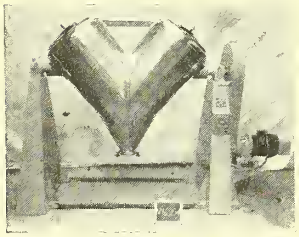

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THE NUFFIELD FOUNDATION

Statue of Lord Nuffield in grounds of Guy's Hospital, London.

The great philanthropist Lord Nuffield has within memory inaugurated a number of trust deeds to carry out defined objects. The Nuffield Foundation was founded in 1943. Its resources consist of the Nuffield Fund, which is a capital fund of £10 millions provided by Lord Nuffield, and an auxiliary fund, for which the trustees may accept gifts and bequests from other persons wishing to advance the objects of the Foundation. The deed indicates that the purposes of the Foundation are the advancement of health and the prevention and relief of sickness—in particular by medical research and teaching and by the organisation and development of medical and health services; the advancement of social well-being, in particular by scientific research and by the organisation, development and improvement of technical and commercial education, including the training of teachers and provision of scholarships and prizes; the care and comfort of the aged poor; and the advancement of education. In the eleventh report of the Nuffield Foundation (1955-56) already quoted, the author states that "sometimes they (Foundations) seem to be shadowy universal uncles whimsically distributing largesse to the 'lucky Jims'". Later it is suggested that a foundation gets thought of as a private bank which finances projects not in terms of cash but in terms of public good. "It is out for high dividends and can afford to balance its failures against its successes . . . with depressing frequency it may find that the number of good projects is greater than the number of good men to carry them out . . . it must go out and seek profitable investment, sternly resisting the temptation to do what is fashionable and immediately popular."

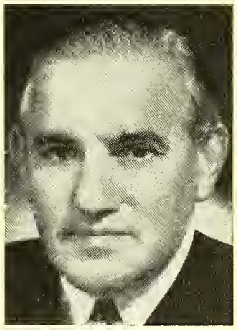
Up to March 1958 the Nuffield Foundation had given away nearly £8·5 millions, of which £6·5 millions had been spent on ventures within the United Kingdom and the remainder in parts of the Commonwealth. Of the £6·5 millions, approximately £1·75 millions was spent in the field of science and technology, and £1·5 millions in the field of medicine. In 1946 the Foundation decided to give to biology the priority it had given to physics during the first three years of its existence. The trustees felt that biology had important contributions to make to medicine and agriculture. In the Foundation's thirteenth report the trustees indicated that they would support work which promised to lead to a new understanding of biological processes. The Foundation administers the Oliver Bird Fund of £450,000 on trust as part of its auxiliary fund, the special objects of the Bird fund being the promotion of research into the prevention and cure of rheumatism. Because of that special interest the Nuffield Foundation and the Medical Research Council together instituted controlled clinical trials of cortisone and allied hormones in the treatment of chronic rheumatic diseases; a comparative trial of cortisone and prednisone; and a comparison of prednisolone with aspirin and other analgesics.

THE NUFFIELD PROVINCIAL HOSPITALS TRUST

Another trust deed inaugurated in 1939 by Lord Nuffield established the Nuffield Provincial Hospitals Trust. That was endowed with one million share units in Morris Motors, Ltd. The purposes of the Trust are "the co-ordination on a regional basis of hospital and auxiliary medical services as, in the opinion of the governing trustees, are necessary for such co-ordination." When the Trust was formed by Lord Nuffield it was hoped that, in the course of time, a truly national hospital service might be evolved "which would embrace all that is best of both public and voluntary effort, with the maximum of economy to the State and to the private purse." The coming of the National Health Service appeared to achieve the main purpose of the Trust, but the trustees considered there was much useful work which an independent body still could do in investigating and analysing the working of the Health Service and in undertaking experiments and making suggestions for its improvement.

The Trust has initiated a number of widely differing projects, all within the orbit of the deed. Their variety may be judged from the following, taken from a recent report: Case load studies; a study into the cost of mental illness; a study of accident-proneness among bus drivers in Belfast; a staff-location system for hospitals; prescribing by family doctors; and training for hospital administrators.

THE ISAAC WOLFSON FOUNDATION



Mr Isaac Wolfson

A relatively new institution, the Isaac Wolfson Foundation, was created by Mr. Wolfson in 1955. It has a capital fund (mainly holdings in the Great Universal Stores, Ltd.) amounting to upwards of £6 millions, and its policy is primarily the advancement of education and health in the United Kingdom and Commonwealth, with particular reference to scientific and technological education, building facilities for higher education, youth activities, general medical research, cancer research, medical, surgical and nursing services. The chairman of its board of trustees is Lord Nathan, and its office is at 20 Copthall Avenue, London, E.C.2.

Within the short period of its existence the Foundation had, up to September 1959, disbursed no less than £2,363,000.

THE ANIMAL HEALTH TRUST

Active in veterinary research has been the Animal Health Trust, founded in 1942 by Dr. W. R. Wooldridge, F.R.C.V.S. Since that date the Trust has established four separate research centres devoted respectively to the scientific investigation of the diseases and health problems of horses, dogs, poultry and farm livestock (cattle, sheep and pigs). The centres are the Equine Research Centre, Balaton Lodge, Newmarket, Suffolk; the Canine Health Centre, Kennett, nr. Newmarket; the Houghton Poultry Research Centre, Houghton Grange, Houghton, Huntingdon (now run as a grant-aided institution in conjunction with the Agricultural Research Council); and the Farm Livestock Research Centre, Lilystone Hall, Stock, Essex. Each of those centres maintains specialist services through which practising veterinary surgeons and animal owners may obtain assistance in diagnosis and advice on the treatment of difficult and obscure cases. A limited amount of hospitalisation is also available, but all requests for such help have to be made in the first place through the local veterinarian in charge of the case. Under the chairmanship of Dr. A. W. Stableforthe, M.R.C.V.S., D.V.S.M., the committee of the Trust is responsible for framing the programmes of work undertaken by the four centres and of co-ordinating them with those of other research establishments. In addition to its research work, the Trust also devotes a large proportion of its resources (specially subscribed for the purpose) to fostering the higher education of young veterinary surgeons and scientists. It makes grants to help students to complete their courses when unforeseen changes in their financial circumstances might otherwise force them to leave their universities prematurely. The Fund is also used to finance the award of post-graduate scholarships and fellowships to enable young veterinarians to pursue their training in research and in other specialist careers.

ACTON SOCIETY TRUST

Readers may recall the publications dealing with certain aspects of the National Health Service issued by the Acton Society Trust (see, for example, *C. & D.*, February 21, p. 200). The Society was founded in 1948 by the Joseph Rowntree Social Service Trust, from which it has derived most of its finances. It has also received specific grants for some of its projects from the Department of Scientific and Industrial Research, but it now looks to industry to provide the basic income for continuity, both in research on industrial problems and in organising conferences on the application of social research in industry. The Trust has been mainly interested in problems concerning the relations between the individual—whether worker or manager—and the organisation. Whilst increasing attention has been given to the problems of technical changes, less work has been done on the problem of human adaptation to rapid change, and that is the field in which the Trust is active. It carries out its own research on subjects where the results can be expected to be of practical value, and publishes the results in non-technical language. Among its many publications have been a series of six booklets on the effects of the National Health Service on hospital organisation and administration.

THE LEVERHULME TRUST

William Hesketh Lever, first Viscount Leverhulme, died in 1925. He had created the world-wide enterprise of Lever Brothers, Ltd., and had shown a practical concern for the welfare and happiness of the thousands of workers in the organisation. In his will he made provision for the establishment of a trust fund of which the purpose was to make payments, at the discretion of the trustees, to charities connected with commercial travellers or grocers or chemists, and to provide scholarships for such purposes of research and education " as my Trustees in their discretion decide."

During May 1933 the Trustees announced their decision to devote from the income of the Fund " the sum of £12,000 a year for the establishment of research Fellowships." The Fellowships were intended in the first instance for the assistance of experienced workers, particularly those who were prevented either by routine duties or by any other cause from undertaking or completing an investigation of value. According to the first report of the Trust, the number of awards made up to and including 1957 was 612, at a total cost of £276,548.

The Trustees have also made awards and grants to institutions widely diverse in character; ranging from schools to universities and centres of higher education. In some cases the Trustees have taken the initiative and begun research projects, such as the assessment of the part to be played by accountancy in management and the teaching at university level of the principles of business administration. The Royal College of Surgeons and the Royal College of Physicians have received assistance from the Trust.

Under the terms of the will the Leverhulme Trust will cease to operate in less than sixty years from now.

THE IVEAGH TRUST

An important Irish trust, the Iveagh Trust, was founded on the famous brewing industry of Dublin. It was established in April 1890 under the title of the Guinness Trust (Dublin Fund) by the late Sir E. C. Guinness (later the first Earl of Iveagh), with a gift of £50,000. Later other properties held by the Guinness Trust as a separate undertaking were amalgamated by Act of Parliament into one consolidated fund as the Iveagh Trust. The fund provides hostels, play centres, flats and houses at economical rents. The capital of the Trust amounts to £546,000.

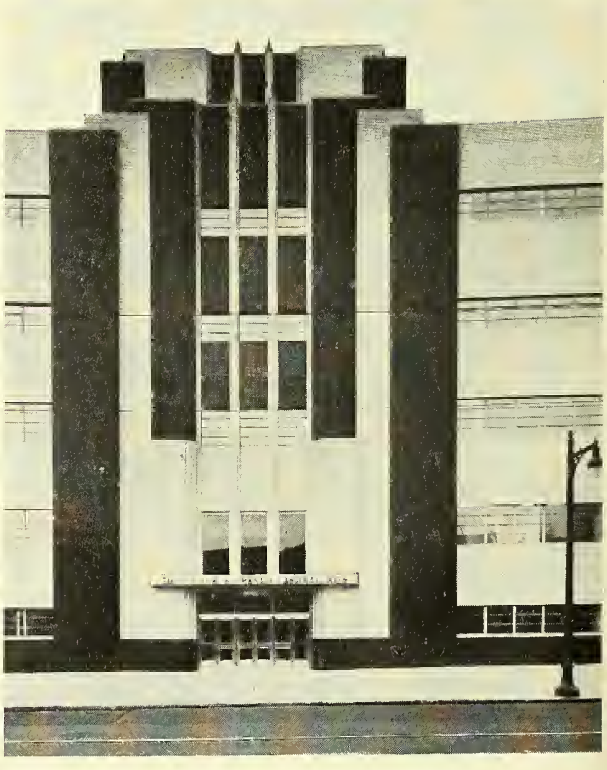
AMERICAN FOUNDATIONS

THE SMITH KLINE & FRENCH FOUNDATION

During 1932 it was authoritatively stated that no one knew the number of chartered foundations in the United States, to say nothing of their purposes, their capital funds, or their annual disbursements. Most published reports, however, agreed that such institutions were increasing in number and were tending to become increasingly active in the sphere of health and medicine.

It is only possible on the present occasion to glance at one or two of the well-known American trusts, for even a sketchy review would fill more than one weighty volume.

The internationally known pharmaceutical company, Smith Kline & French Laboratories has been contributing to charity, education and science for many years, but by 1952 the problems arising from its disbursements for philanthropy had become too complex to be handled on an informal basis. Accordingly the Smith Kline & French Foundation was established. Supported almost entirely by annual contributions from the company, the Foundation has been able to appraise requests for funds more effectively and to allocate grants more evenly over the course of each calendar year than was formerly possible. It is a separate legal entity, though its trustees are employees of Smith Kline &



The Smith Kline & French Laboratories at Philadelphia.

French Laboratories, functioning independently of the company on Foundation matters. The selection of persons intimately concerned with the operation of the company to direct the Foundation's policies was deliberate. The founders' hope was that the same executive ability and vision the trustees showed in business matters could be applied to increasing the effectiveness of the company's donations. The philosophy of the directors is that support should be given to matters with which the company is familiar and in which it has experience. Consequently a large proportion of the Foundation's contributions have been in the field of medicine and the medical sciences, and its educational support has been chiefly through schools of medicine and pharmacy.

The Foundation operates under a trust indenture that gives its three trustees authority to accept, invest and dispense funds for charitable, educational and scientific purposes " in such manner and amounts as the Trustees in their discretion may determine." Without having limits placed on their discretion, the trustees are instructed to " endeavour to give preferential consideration to charitable, educational and scientific uses and purposes which may be related, directly or indirectly, to the welfare of Smith Kline & French's employees and to its interest as a corporation." Grants may not be made outside the United States of America. Recommendations are usually made to the trustees by two committees: a committee of grants in the scientific field and a committee on contributions in the charitable field. Each committee has an executive secretary who reviews requests for grants, keeps committee-meeting records, and maintains contacts within the field of his activities. The committees meet independently four times a year. The spheres in which the Foundation has been active include public charities; basic research in medicine and related sciences; education (preference being given to medicine and pharmacy); buildings and equipment (contributions to the building funds of hospitals and medical and pharmacy schools, and occasionally grants for the purchase of equipment); and mental health (support of medical and lay organisations). Under the aegis of the American Psychiatric Association a fellowship programme was set up with a three-years' grant of $90,000. Contributions by years have been:—1953: $236,900; 1954: $225,950; 1955: $426,005; 1956: $569,021; 1957: $668,000.

THE CARNEGIE TRUSTS

" Although the assets of American foundations are in the neighbourhood of $7·2 billions (£2,520 millions) their yearly expenditures do not constitute a large portion of American philanthropy, which is a very large enterprise," states the report of the Carnegie Corporation of New York for the year 1957. That trust was established in 1911 by Andrew Carnegie to promote the advancement and diffusion of knowledge among the people of the United States and the areas then known as the British Dominions and Colonies. During 1956 the Corporation announced the creation of a Foundation Library Centre with an initial grant of $100,000. According to its charter one of its purposes is to collect, organise and make available to the public reports and information about foundations. Andrew Carnegie also founded the Carnegie Trust for the Universities of Scotland, to assist needy students and to promote research in science, medicine and the humanities. For the people of Great Britain and Ireland he established the Carnegie United Kingdom Trust.

THE ROCKEFELLER FOUNDATION

" To promote the well-being of mankind throughout the world " is the succinct aim of the Rockefeller Foundation. Its activities are widespread, covering the fields of medical education and public health, biological and medical research, agriculture, social sciences, and the humanities. During 1958 the Foundation made a grant of £24,000 to help the Royal Society of Medicine to maintain its medical library during the succeeding five years. The great scope of this Foundation is reflected in the fact that during October-December 1958 grants amounting to over £3 millions were approved for world-wide projects, of which nearly £100,000 was allocated for British projects.

THE W. K. KELLOGG FOUNDATION

The W. K. Kellogg Foundation was founded in Michigan in 1930, its largest asset being 2,261,030 shares, common stock of Kellogg & Co. (par value, $33,105,417; market value on August 31, 1957, $80,831,822). Its purpose is, briefly, to receive and administer funds for educational or charitable purposes. Current fields of interest of the Foundation include medicine, public health, hospitals, dentistry and agriculture. Grants within the category of " medicine " during the year ended August 31, 1957, totalled $707,407.

AMERICAN FOUNDATION FOR PHARMACEUTICAL EDUCATION

Founded in 1942, the American Foundation for Pharmaceutical Education was set up to encourage and assist in providing improved educational standards and facilities for the adequate training of competent personnel in the practice of pharmacy and all related fields; to supply the pharmaceutical and allied manufacturing industries, hospitals, government agencies, college faculties and other professional fields with technically and scientifically trained personnel; to support graduate work in properly qualified colleges; and to encourage scientific research as a necessary component of graduate work and as special projects.

The idea of the Foundation was developed in a National Drug Trade Conference at which every branch of pharmacy was represented. It derives its income from individuals and from the contributions of the drug trade and allied manufacturing industries. Throughout the second world war many American Colleges of Pharmacy were in financial difficulties, and the Foundation began its career by granting them financial aid. Every year since 1949 it has financed a Pharmacy Teachers' Seminar, thus providing valuable refresher courses to teachers from colleges of pharmacy. Over 1,600 scholarships have been awarded to help pharmacy students to complete their education, and nearly 500 graduate fellowships have been granted. The Foundation in 1952 introduced " teaching fellowships in business administration " to produce teachers qualified in pharmacy administration to instruct future pharmacists in salesmanship, merchandising and pharmacy management.

THE GULBENKIAN FOUNDATION

Though established only in 1956, the Gulbenkian Foundation has already made grants of around £2·5 millions, about half of which has been applied within the British Commonwealth. The late Mr. Calouste Sarkis Gulbenkian (Mr. 5 per cent.), an American who became a British citizen, made his fortune from Middle East oil. He bequeathed his fortune and art treasures to establish a foundation in Portugal. " The purposes of the Foundation are charitable, artistic, educational and scientific. The activities . . . will be exercised not only in Portugal but also in any other country where its administrators deem it expedient."

The bulk of the bequest was derived from the famous 5 per cent. share of the output of the Iraq Petroleum Company, which yields in a normal year around £5 millions. The trustees have indicated, however, that they would invest the revenues thus obtained in areas less hazardous commercially, and would disburse only the income from the reinvestments.

The Gulbenkian Trustees have been active in Portugal, the British Commonwealth, the Middle East and Armenia (where the emphasis has been on traditional charity, schools, hospitals, housing and assisted education). In Britain, because science and social welfare are largely supported by the State and industry, the Gulbenkian Trustees have decided to support the arts.

An Elizabethan Apothecary's Inventory...

R. SHARPE FRANCE, M.A. (*Lancashire County Archivist*)

THERE has come to light among the probate records in the Lancashire Record Office the inventory of an Elizabethan travelling apothecary. Such documents are rare, and give a valuable picture of the stock-in-trade of the period. Though it is difficult to equate the value of money in the past with current values, one may perhaps suggest that multiplication of the amounts in the inventory by twelve would give approximate modern costs; though it is probable that the Elizabethans were no more prone to over-value for probate purposes than are their successors today.

Nothing is known of Zachary Linton, the apothecary, except that he was buried at Warrington. The author has been unable to identify Osletes. Perhaps some reader can ?

An Inventorie of the Goodes of Zacharie Linton,
Taken the xviiith of Februarie 1593 [4]

		s.	d.
Sarsaphras	4 ozs	1	0
Epithimum [Dodder—Cuscuta Epithymum]	4 ozs		8
Rubarbe	1½ ozs	—	
Mirabilons [Myrabilon]	12 ozs	2	0
Turbith [Turpeth]	2 ozs	1	6
Lapis Tutia [Tutty—crude ZnO]	4 ozs	2	0
Harmodactile [Hermodactyl—Colchicum]			
Camepithios [Yellow Bugle]	4 ozs		6
Storax Calami	1½ ozs		10
Beniomen [Benzoin]	6 drms		3
Mastick	2 ozs		9
Cortex Capris [Caper—Capparis spinosa]	4 ozs		4
Coralina [Seaweed—Corallina officinalis]	2 ozs		3
Esula Maior [Spurge—Euphorbium Esula]	2 ozs		3
Radix Corall [Cardamine bulbifera]	3 ozs		2
Radix China [Smilax China]	2½ ozs		6
Mirr [Myrrh]	2 ozs		10
Spica Celtica [Valeriana celtica]	1½ ozs		3
Agrick [Agaric]	3½ ozs	3	6
Gum Elemni [Elemi]	6 ozs		10
Gum Armonick [Gum Ammoniac]	1 oz.		2
Lupins	2 ozs		3
Cartamus Seed [Safflower—Carthamus tinctoria]	2 ozs		4
Lignum Balsamum [Balsam wood]	1 oz		3
Certayne seeds			6
Stavesacre	12 ozs	1	0
Coliander seed			3
Lapis Calaminaris [Calamine]	10 ozs		4
W[hi]te Copris [White Copperas—ZnSO4]	10 ozs		4
Ladamum [Gum Ladanum]	3 ozs		4
Literge of Silver, lead and Gould [Litharge of silver—litharge as by-product of separation of silver from lead; litharge of gold—litharge coloured by admixture of red lead]	3 lbs		6
Aloes	4 ozs	3	0
Terra Sigillata [Lemnian Earth]	3 ozs		2
Scamoni	½ oz		10
Sanguis Draco [Dragon's Blood]	½ oz		3
More Aloes	3 ozs		9
Precipitat	1 oz	1	0
Opium	½ oz		6
Camphire	1½ oz	1	4
Cantarides			4
Certayne sweet spices in a box		4	4
Medenheare [Maidenhair Fern]			6
Cipris [Galingale—Cyperus longus]	1 lb.		4
Polipodie [Polybody Fern]			3
Eliborus [Hellebore]	1¼ lbs	2	0
Cortex Quatia [Quassia bark]	2 lbs	2	0
Sarsaperila	1½ lbs	5	0
Rossetes [Resin]	12 ozs		6
Ortment [Orpiment]	1 lb		8
[1]Oxsecrotium [Oxycroceum—Saffron Plaster]	1 lb	2	6
Treat, green and yelow [Ointments]	5 lbs	2	6
[2]Pilule Aurea [Golden Pills]	2 drms	1	8
[3]Diacholicon [Diachylon Plaster]	½ lb	2	6
Conserva Roses, not made		1	0
Electuarie of Roses	1¼ lbs	5	0
[4]Diaphinicon [An electuary]	10 ozs	3	0
Sirope with Succorie		2	6
[5]Ung[uen]t[um] Comitisse [Countesses Ointment]	12 ozs	1	6
[6]Ung[uen]t[um] Dealtheae [Dialthia Ointment]		4	0
[7]Ung[uen]t[um] Martiatum	½ lb	1	4
Ung[uen]t[um] Popilion [Black Poplar Ointment]			8
For certayne oyls		4	6
Osletes	1¼ lbs	3	0
Ceruse [White Lead]	3 lbs	1	6
Diascordium [Water Germander—Teucrium Scordium]	2 ozs		8
Certayn powders		6	8
Water Glasses	19	3	4
Oyle Glasses	9	1	8
Garre Glasses [Jars]	20	1	6
Viall Glasses	10		6
Oyle Mazes [Mace Oil]	3 ozs	3	0
Conserva Prunolorum [Conserve of Prunella—Self-heal]		2	0
Sirope Potes	8	4	0
Conserve Pottes	2	1	0
For pottes empty and full		3	4
For certayne oyls that are infused in the pottes		10	0
Linseed Oyle	2 gall	5	4
For a bottle covered with lether		1	0
For a glass stilitorie [retort]		1	6
For great black pottes		1	8
For 6 blacke boxes and one comfit boxe		6	0
[8]Narvoyle unstrayned, with the barrell		1	8
For a double searse [sieve]		1	8
For bagges			4
1 stonne morter		1	6
Gum			2
A booke of Distolations		1	0
1 Gramer [grammar]			6
For 3 other little bookes			8
Browne paper	18 quires	1	4
1 Standishe			5
Pented clothes [painted cloths, probably for his stall]		3	0
Bras waights, 1 lb. 2 ozs.			8
Certayne Instrumentes with casse		1	4
For 6 other bookes		1	4

Praised by me John Hus,[9] chirurgion
Edw. Tickhill[10]

His apparell praysed:

For his apparell	1	11	0
For his bootes and sadle		3	0

Summa £8 19s. 6d.

Notes on the Entries

1. Oxycroceum—a plaster composed of saffron, tar, colophony, wax, turpentine, galbanum, ammoniacum, myrrh, frankincense and mastic.
2. Golden pills—alloas, diocrydis (?), roses, celery seed, aniseed, fennel seed, hiera picra, saffron, colocynth, tragacanth.
3. Diachylon—a plaster composed of litharge, oil of rue, oil of chamomile, oil of dill, turpentine, resin, beeswax, linseed, fenugreek, figs, raisins, henna, isinglass, iris juice, squill juice and lanolin.
4. Diaphaenicon—an electuary composed of dates, barley sugar, turpeth, sweet almonds, scammony, ginger, long pepper, rue, cinnamon, mace, aloes. aniseed, fennel seed, carrot seed and galanga.
5. Countesses ointment—chestnut bark, acorns, beans, myrtle, horsetail, galls, elderberries, service-tree berries, figs, medlars, pear leaves, greater celandine, plaintain, myrtle, white wax, mastic and burnt ox-bone.
6. Dialthea ointment—bismalve root (?), fenugreek seed, linseed, squill, beeswax, colophony, resin, turpentine, galbanum and ivy juice.
7. Martiate ointment—beeswax, common oil and 63 vegetable ingredients.
8. Nerve oil—used for strained sinews.
9. John Hussie of Warrington, described at his death as " gentleman "; was buried 5 Jul. 1619. His goods, valued at £42 7s. included " a morter and a limbecke 12s.".
10. Edward Tyckhill of Manchester, apothecary, was buried on August 30, 1616. There is no inventory.

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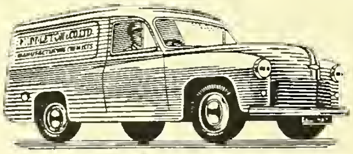

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Write for the discreet "Family Planning Requisites" shelf strip (No. 30), which shows that you are a DUREX stockist. It will bring you extra business—so put it on display.

LONDON RUBBER CO. LTD., HALL LANE, LONDON, E.4

PRIDE

hair beauty PREPARATIONS sell on sight!

Spraying HAIR Lacquer

Retails at 3/6

The finest of hair lacquers with a delightful perfume available in the new Super Spray 2½ oz. polythene bottle (various colours) in attractive individually packed cartons, and boxed in 1 doz. units in eye-catching display outers. Refill sachets also available packed in 2 doz. outers retail at 2/4.

Egg and Lemon

CREAM SHAMPOO Retails at 3/9

24 shampoos in plastic injector dispenser—Hair and scalp always kept at its best with this high-foaming soapless cream shampoo made from the natural benefits of shell eggs and juice of fresh lemons. Trial—3 shampoos, tubes 9d.; 3 individual shampoos linked together 10½d. all packed in well-designed display outers.

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Retails at 3/3

An alleviating scalp lotion for use after shampooing and before setting. Allays scurf irritation; quick drying action holds the hair, removes tangles, leaves hair free from all deposits and with a beautiful lustre.

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Pride Colour Streaks—six colours, Retails at 3/3d.
Pride Spraying Brilliantine—2 oz. self-spray polythene bottle, Retails at 3/6d.
Pride Beer Shampoo, Retails at 7d.
Pride Champagne Shampoo, Retails at 7d.
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Bubble Bath, Retails at 7½d.

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These Fast-Selling lines are being advertised continuously in National magazines.

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Over 100-year-old reputation for efficacy in the relief of the pains of Rheumatism, Gout, Lumbago, Sciatica and Neuritis.

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RETAIL (inc. Pur. Tax)	WHOLESALE (Plus Tax)	RETAIL (inc. Pur. Tax)	WHOLESALE (Plus Tax)
1/10	13/6 doz.	1/10	13/6 doz.
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AntiBil
ANTIBILIOUS PILLS
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RETAIL Inc. Pur. Tax.	WHOLESALE Plus Tax
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Some 300 Proprietary Manufacturers, 800 Wholesalers (including affiliated members) and 11,000 Retail Chemists are members of the Proprietary Articles Trade Association—which continues to foster the interests of those manufacturers, wholesalers and retailers who believe in price maintenance.

The principal "object" of the P.A.T.A. is "the furnishing to its members of advice, information and assistance (financial or otherwise) relating to matters of common interest."

Under Section 25 of the Restrictive Trade Practices Act, 1956, manufacturer members of the P.A.T.A. who attach price conditions to their goods are empowered to enforce such conditions in the Courts, and the Association is able to assist them to use the legal facilities available for the purpose.

The *P.A.T.A. List of Manufacturers' Fixed Prices* and the *P.A.T.A. Quarterly Record* enable the trade generally to identify those manufacturers who impose conditions fixing wholesale and retail prices. Membership of the P.A.T.A. affords to the manufacturer the means by which his individual price maintenance scheme can be economically and effectively enforced.

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Secretary: H. E. CHAPMAN, M.P.S., F.C.S., J.P.

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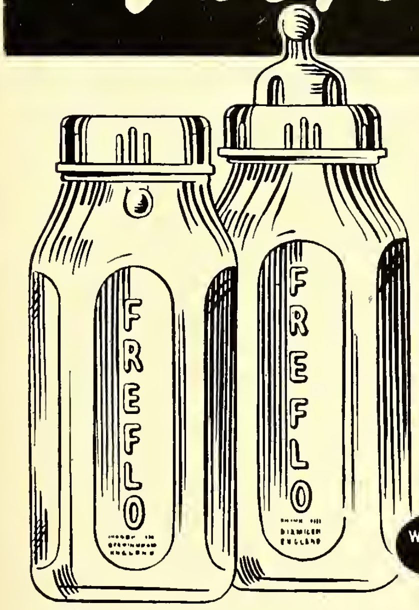

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NOW FITTED WITH HIGH DENSITY UNBREAKABLE POLYTHENE CAPS IN BLUE, PINK & NATURAL SHADES THESE FEEDERS CAN BE STERILIZED BY BOILING

THE FINEST AND CHEAPEST FEEDER IN THE WORLD

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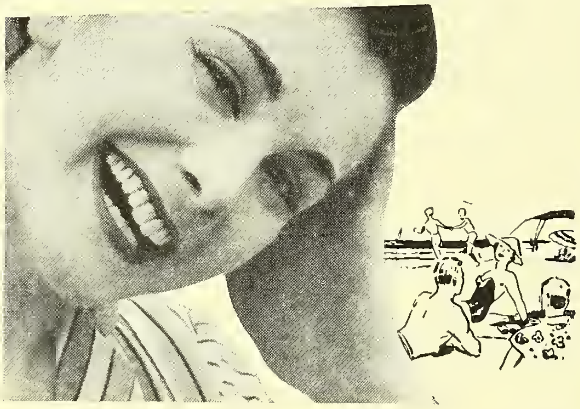
Now being launched in women's papers

the smile is yours ....



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THE NEW TOOTH COSMETIC

Not a toothpaste, but something new . . . a beautifier to paint straight on to your teeth to give them vibrancy, sparkle and a pearly whiteness they've never had before! Dries in a twinkling—lasts for hours.

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MBL

DETENSYL
Vegeto-Polyhormonic Hypotensor
is the treatment required

DETENSYL is another of the M.B.L. preparations which has been accepted by doctors in many countries. In various indications associated with blood pressure, regular administration restores normality. A small, periodic dosage is recommended for maintenance. DETENSYL contains mistletoe, liver, pancreas and lung substances. More than a palliative, it re-educates the endocrine glands, allowing them to resume their regulation of the arterial tension.

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Conditions frequently associated with blood pressure, such as **Menopausal Disturbances, Arteriosclerosis, Sclerosis of the Kidneys, Persistent Cephalagia, Arthritis and Auditory and Ocular Troubles,** respond to DETENSYL therapy and almost inevitably disappear with the lowering of arterial tension.

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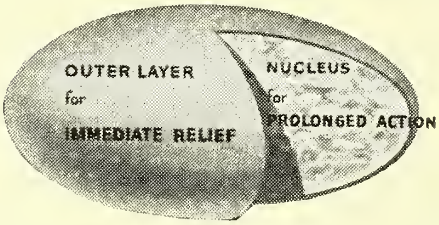

A modern two-phase Asthma therapy

ISO-BRONCHISAN TABLETS

The unique action of Iso-Bronchisan tablets provides the asthmatic patient with *immediate* asthma control PLUS *prolonged* relief from symptoms. For *paediatric use* special tablets are available containing proportionately smaller quantities of the effective ingredients.

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Tubes of 20	Retail 4/9d.	Trade 3/7d.
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Tubes of 20	Retail 3/4d.	Trade 2/6d.
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PRESCRIBABLE ON FORM E.C.10

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An IMPROVED theophylline therapy specially indicated for Cardiac failure . . . Bronchospasm . . . Bronchial Asthma.

Silbephylline is a stable, soluble and neutral theophylline derivative (dihydroxypropyl theophylline). It has very definite advantages in administration and can be given by any route without side effects.

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Ampoules of 2cc in boxes of 6 and 50	7/7d. and 51/9d.	5/8d. and 38/10d.
Suppositories in boxes of 6 and 50	5/2d. and 34/6d.	3/10d. and 25/11d.
Tablets in packs of 24	5/2d.	3/10d.
Bottles of 100	14/8d.	11/-
Bottles of 500	71/9d.	53/10d.

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PREPARATIONS

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ASTHMA TABLETS

Containing a combination of powerful bronchodilator agents, ephedrine, theophylline and calcium benzylphthalate, Silbe ASTHMA tablets are the preparation *par excellence* for prophylaxis and treatment.

	Retail	*Trade*
Pack of 8 tablets	*1/10d.*	*1/6d.*
Box of 24 tablets	*4/2d.*	*3/4d.*
Bottle of 80 tablets	*12/6d.*	*9/11d.*

(including P.T.)

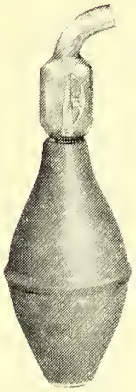
SILBE
ASTHMA INHALANT

Silbe ASTHMA Inhalant is a scientific preparation designed to give the most beneficial therapeutic response and provides immediate and long lasting relief from asthmatic attacks.

Bottle of $\frac{3}{4}$ oz. (21 grammes)

Retail 8/– *Trade 5/–*

SILBE Vest Pocket ATOMISER



Designed to give a specially fine mist, this highly-efficient nebulizer is extremely convenient to carry and easy to operate.
Although specially recommended for use with Silbe Asthma Inhalant, it can be used with any Inhalant.

Retail Price 9/- *Trade Price 5/5*

Other SILBE Atomisers are available and a trade discount of 40% is allowed on all models.

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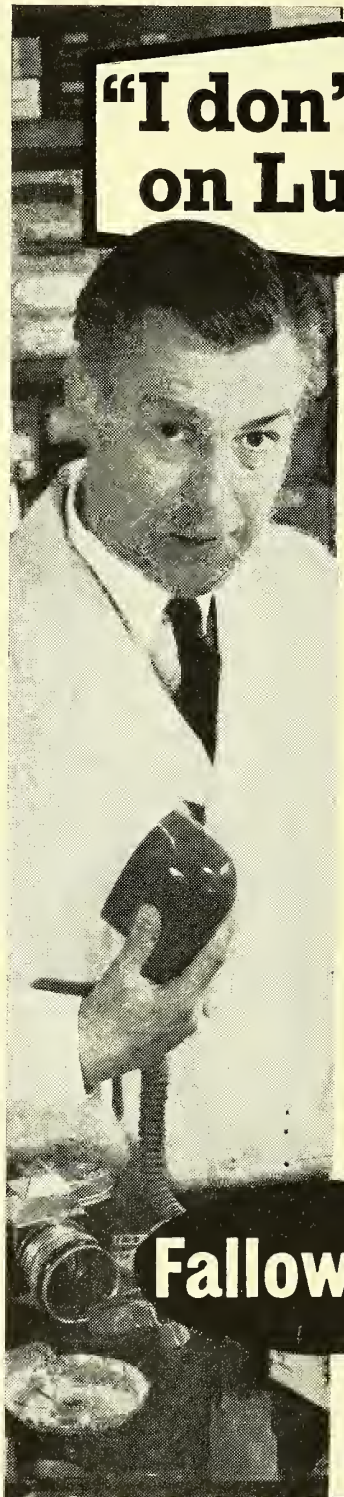

" You can't rely on luck in the photographic business. I like to tell a customer definitely that I can get an item for him with certainty. That's where Fallowfield's come in. Their 24-hour service is just the ticket. I don't have to break off in the middle of a hard-selling day very often now. It's a rare event indeed if they haven't got something I need—rarer still if they can't get it. Another thing—there's never any hesitation from Fallowfield's about the quantity of an order—large or small it's just the same to them. Take my tip—try Fallowfield, you won't regret it."

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PLEASE PUT ME ON YOUR MAILING LIST

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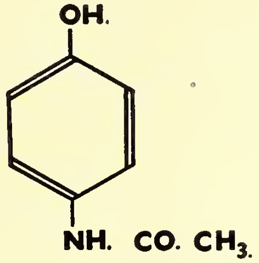
The non-salicylate analgesic



N-acetyl p. aminophenol

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Brush away

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Still the best hair tint. In all natural Shades. Stocked by all Wholesalers. Trade prices: 1-oz., 26/2 per doz., 2-oz., 37/11 per doz. Purchase Tax 60%. Retail prices, 4/- and 5/9½ per bottle respectively.

Also the new GOLDEN SHADEINE for lightening mousey hair. 2-oz. size at 26/2 per doz. Purchase Tax 60%. Retailing at 4/- per bottle.

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P.C.M.X. and D.C.M.X.

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★ NO GASTRIC UPSET

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Handsome display outers

20's (1/6) in 2 doz. (Very handsome display outers) 9/2 per doz.
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100's (4/9) 25/-. All plus Purchase Tax.

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15/6
per 1,000

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Sole Proprietors—
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Union St., London, S.E.1
FOR OVER 100 YEARS

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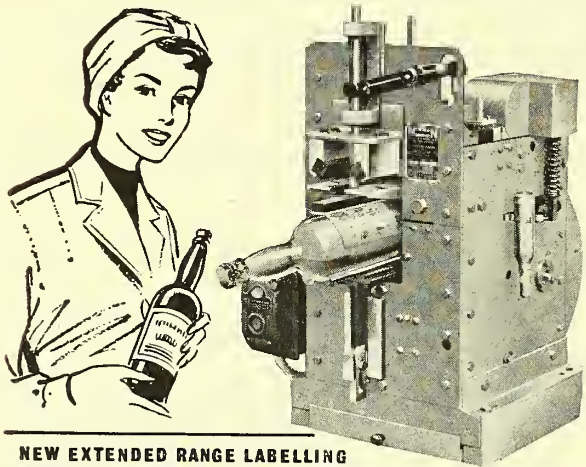
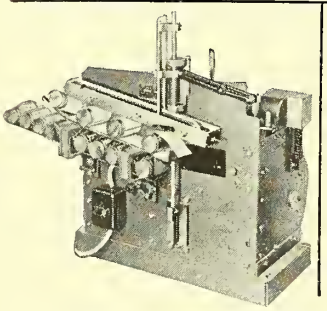
Stick by **NEWMAN** *for better labelling*

The new NEWMAN LABELLING MACHINES



NEW EXTENDED RANGE LABELLING MACHINE MODEL 24A. Versatile Semi-Automatic Bench model Gums and applies labels maximum size 7″ x 5¼″ to a wide range of bottles, etc., up to quart size. Automatic label coding available. Speeds up to 40 per min.



AUTOMATIC BENCH MODEL 4B. LABELLING MACHINE for small bottles, vials, cans, tubes, etc., $\frac{7}{16}$″–2¼″ diameter labels up to 7″ wide. Speed 40 per min. Only 2 ft. bench space needed.

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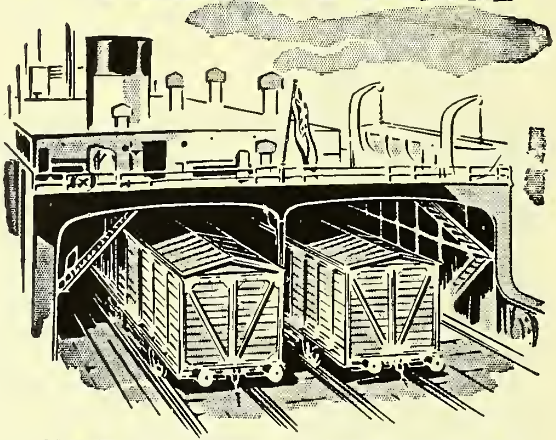
Goods to European Markets in through wagons every day

BY **TRAIN FERRY**



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Packing and handling absolute minimum

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VANILLIN 100%

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36 Full Size Swabs for 1/-
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Single Tipped, splinterproof, hygienic. Uniquely packed. Every stick visible and handy.

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FOR
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✱ **YOUR CUSTOMER**

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Hair Magic semi-permanent Browns cover up to 50% of greying hair in one simple operation, with flattering Brown, Ashen Brown and Chestnut Brown

Hair Magic is best for you too, bringing in 80% profit on every bottle you sell.

and here's how

CHEMIST'S PRICE 1/8 PER BOTTLE PLUS 50% P.T.

RETAIL PRICE INC P.T. **3/10** PER BOTTLE

✱

CHEMIST'S PROFIT 1/4 PER BOTTLE ... OR 80% PROFIT

and remember

all the other Hair Magic shades give you the same profit.

CFH/INS8/17

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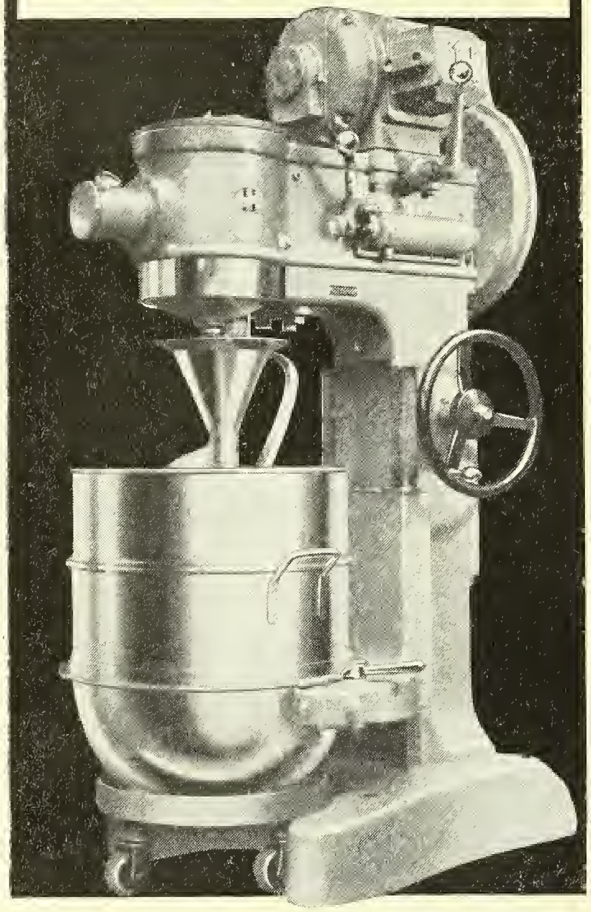

—you need the superb efficiency of a planetary action Hobart Mixer

Hobart Mixers ensure the very best results, whatever the ingredients— even the most impermeable. Recent tests at British Quarries, where a Hobart mixer was employed, showed on analysis that, on a mix of 96% stone chippings and 4% bitumen, the bitumen content of any part of the batch was between 3·9% and 4·1%.

There are six Hobart Planetary Action Mixers - capacities from 10 to 100 quarts.

Send for full details

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Telephone : ENTerprise 1212

Divisional Offices and Service Depots at :
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The customer who wants a mildly medicated soap; and the customer who likes a top-quality toilet soap; you will sell Cuticura to both. Only Cuticura Soap has this happy combination. Superfatted to give a rich, fragrant lather, it is also—like Cuticura Talcum and Shaving Stick, those other best-sellers—mildly medicated to give skin health. It pays to display and recommend

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also

TALCUM POWDER • OINTMENT
HANDCREAM • MEDICATED LIQUID
SHAVING STICK

89

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STAINLESS STEELWARE

ISAAC WEBSTER & SONS LTD.
ABBEY WORKS
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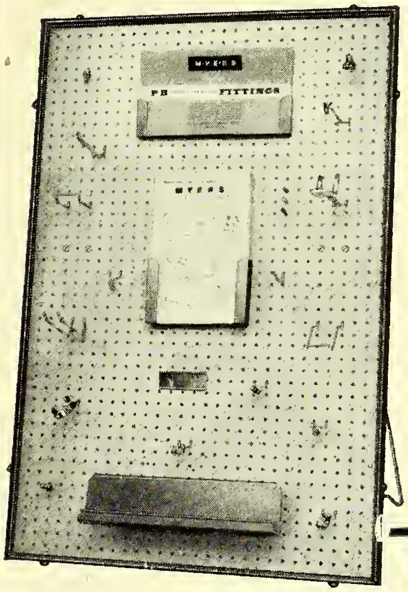

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using M*Y*E*R*S

PB (Perforated Board) display panel and fittings

No. 4870 — A perforated board panel, 35½ins. × 23½ins. in glossy black, leaf green or light blue with light grey enamelled steel frame. Strut at rear adjusts to any display angle and also shows panel vertically or horizontally. Used with MYERS P B fittings an inexpensive, portable and changeable display can rapidly be prepared. Ideal for displaying boxed, canned or carded goods, compacts, cosmetics, hairdressing and shaving accessories, photographic goods, etc.

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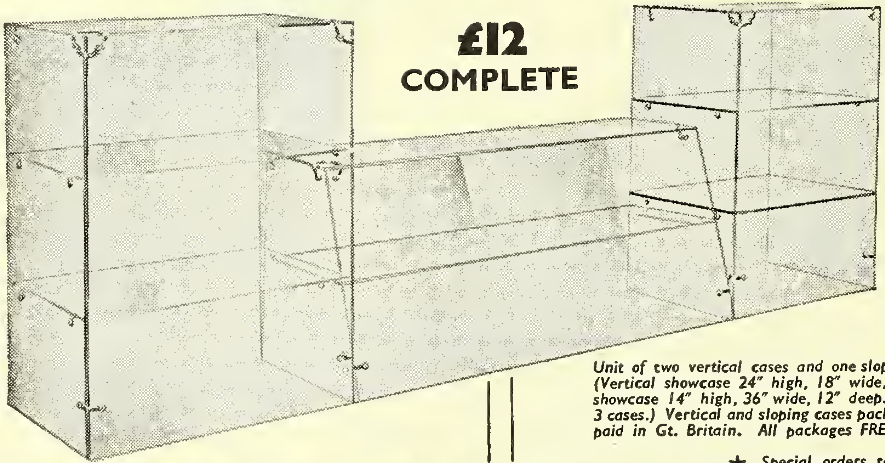

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